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KEY TO  
COMPLETE ARITHMETIC

*Edw. T. H. ...*



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Greenleaf's Mathematical Series.

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° KEY  
TO  
COMPLETE  
ARITHMETIC.

ON THE BASIS OF WORKS

By BENJAMIN GREENLEAF, A.M.

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BOSTON:  
ROBERT S. DAVIS AND COMPANY.

Edw T 118.52 440  
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# CONTENTS.

<b>Addition.</b>	<b>PAGE</b>	<b>Article</b>	<b>PAGE</b>	<b>Miscellaneous</b>	<b>PAGE</b>
Article 37.....	1	126.....	38	Miscellaneous.....	91
“ 39.....	1	“ 127.....	38	Article 231.....	92
<b>Subtraction.</b>		“ 128.....	39	<b>Percentage.</b>	
Article 46.....	2	“ 129.....	40	Article 241.....	99
“ 48.....	2	“ 130.....	41	“ 242.....	99
Miscellaneous.....	2	“ 131.....	41	“ 243.....	100
<b>Multiplication.</b>		“ 132.....	42	“ 244.....	101
Article 58.....	4	“ 133.....	43	“ 246.....	102
“ 60.....	4	“ 134.....	45	“ 248.....	104
“ 61.....	7	“ 135.....	45	“ 252.....	105
Miscellaneous.....	8	Miscellaneous.....	46	Miscellaneous.....	106
		Article 136.....	49		
<b>Division.</b>		<b>Decimals.</b>		<b>Interest.</b>	
Article 71.....	10	Article 142.....	55	Article 259.....	110
“ 72.....	10	“ 143.....	55	“ 260.....	110
“ 74.....	11	“ 144.....	55	“ 262.....	111
“ 75.....	15	“ 145.....	55	“ 263.....	113
Miscellaneous.....	19	“ 146.....	56	“ 264.....	115
Article 76.....	20	“ 147.....	57	“ 265.....	123
		Miscellaneous.....	58	<b>Problems in Interest.</b>	
<b>Factors.</b>		<b>U. S. Money.</b>		Article 266.....	124
Article 82.....	25	Article 154.....	62	“ 267.....	125
“ 83.....	26	“ 156.....	64	“ 268.....	126
“ 85.....	27	“ 159.....	66	<b>Partial Payments.</b>	
“ 86.....	27	<b>Compound Numbers</b>		Article 282.....	127
“ 90.....	28	Article 187.....	69	“ 283.....	131
“ 91.....	28	“ 188.....	69	<b>Compound Interest.</b>	
“ 92.....	29	“ 189.....	72	Article 285.....	132
“ 96.....	32	“ 190.....	73	“ 286.....	132
“ 97.....	32	“ 191.....	75	“ 287.....	135
Miscellaneous.....	33	“ 192.....	76	<b>Discount.</b>	
<b>Common Fractions.</b>		“ 193.....	78	Article 291.....	136
Article 111.....	34	“ 194.....	79	“ 292.....	136
“ 112.....	34	“ 195.....	80	“ 294.....	136
“ 114.....	35	“ 196.....	81	<b>Bank Discount.</b>	
“ 115.....	35	Miscellaneous.....	82	Article 300.....	137
“ 116.....	35	<b>Metric System.</b>		“ 301.....	141
“ 117.....	35	Article 213.....	85	Miscellaneous.....	142
“ 120.....	35	<b>Measurements.</b>		<b>Stock Investments.</b>	
“ 121.....	36	Article 222.....	87	Article 314.....	144
“ 123.....	36	“ 226.....	89		
“ 124.....	36	“ 227.....	90		
“ 125.....	37	“ 230.....	90		



<b>Exchange.</b>	Article 417 ..... 194	<b>Miscellaneous.</b>
Article 323 ..... 145	" 418 ..... 196	Article 454 ..... 253
" 330 ..... 147	<b>Common Fractions.</b>	" 455 ..... 255
<b>Average of Paym'ts.</b>	Article 419 ..... 197	" 456 ..... 257
Article 334 ..... 148	" 420 ..... 199	" 457 ..... 259
" 335 ..... 149	" 421 ..... 201	" 458 ..... 260
<b>Review.</b>	" 422 ..... 202	" 459 ..... 262
Article 336 ..... 151	" 423 ..... 204	" 460 ..... 264
<b>Proportion.</b>	" 424 ..... 205	" 461 ..... 266
Article 348 ..... 155	" 425 ..... 206	" 462 ..... 267
" 349 ..... 156	" 426 ..... 207	" 463 ..... 269
" 350 ..... 157	<b>Decimals.</b>	<b>Appendix.</b>
" 352 ..... 158	Article 427 ..... 209	Article 466 ..... 272
<b>Partnership.</b>	" 428 ..... 210	" 474 ..... 272
Article 356 ..... 160	" 429 ..... 211	" 478 ..... 273
" 357 ..... 161	<b>Compound Numbers</b>	" 481 ..... 274
" 358 ..... 162	Article 430 ..... 212	" 486 ..... 274
<b>Involution.</b>	" 431 ..... 213	" 493 ..... 275
Article 353 ..... 165	" 432 ..... 215	" 494 ..... 277
<b>Square Root.</b>	" 433 ..... 216	" 497 ..... 279
Article 375 ..... 165	" 434 ..... 218	" 505 ..... 280
" 376 ..... 167	" 435 ..... 219	" 510 ..... 281
<b>Cube Root.</b>	" 436 ..... 221	" 514 ..... 282
Article 384 ..... 169	" 437 ..... 223	" 515 ..... 282
" 385 ..... 175	<b>Percentage.</b>	" 518 ..... 283
<b>Mensuration.</b>	Article 438 ..... 224	" 520 ..... 283
Article 390 ..... 176	" 439 ..... 226	" 526 ..... 283
" 394 ..... 176	" 440 ..... 228	" 532 ..... 285
" 396 ..... 176	" 441 ..... 229	" 538 ..... 287
" 398 ..... 177	" 442 ..... 231	" 543 ..... 289
" 400 ..... 177	" 443 ..... 232	" 544 ..... 289
" 403 ..... 177	<b>Interest.</b>	" 546 ..... 290
" 405 ..... 178	Article 444 ..... 233	" 547 ..... 290
" 407 ..... 178	" 445 ..... 235	<b>College Papers.</b>
" 409 ..... 179	" 446 ..... 237	Article 548 ..... 291
" 412 ..... 180	" 447 ..... 239	" 549 ..... 292
<b>Review.</b>	" 448 ..... 241	" 550 ..... 293
Article 413 ..... 180	<b>Stocks.</b>	" 551 ..... 294
<b>Examination Questions.</b>	Article 449 ..... 243	" 552 ..... 295
Article 414 ..... 191	<b>Proportion.</b>	" 553 ..... 296
" 415 ..... 192	Article 450 ..... 245	" 554 ..... 297
" 416 ..... 193	" 451 ..... 247	" 555 ..... 299
	<b>Roots.</b>	" 556 ..... 300
	Article 452 ..... 250	" 557 ..... 301
	" 453 ..... 251	

# KEY TO THE COMPLETE ARITHMETIC.

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## Article 37.

44. 1009.	49. \$ 499.	81. \$ 31.355.
45. 669.	50. \$ 1465.	82. \$ 39.928.
46. 698.	79. 1484.	83. \$ 61.665.
47. 759.	80. 1149.	84. \$ 317.40.
48. \$ 989.		

## Article 39.

85. 689.	103. 176.40.	121. 24445.
86. 1978.	104. 153.89.	122. 313.54.
87. 2396.	105. 281.72.	123. 150.390.
88. 15485.	106. 5233.97.	124. 29002 ft.
89. 2052.	107. \$ 125.65.	125. 3578392.
90. 9788.	108. \$ 511.69.	126. \$ 1046.87.
91. 2018.7.	109. \$ 168.08.	127. \$ 175430.
92. 143.91.	110. \$ 532.40.	128. 62611.
93. \$ 131.31.	111. 998.	129. \$ 39320.
94. \$ 100.66.	112. 4391.	130. 1323925.63.
95. \$ 393.30.	113. \$ 9665.68.	131. 1863189.
96. \$ 230.05.	114. 5619.	132. 563972744718.
97. 3018.	115. \$ 75.13.	133. 509006545503.418.
98. 3443.	116. 318381.	134. 323497.
99. 7736.	117. \$ 145.17.	135. 340522022.
100. 2023.	118. \$ 360.	136. 1380855.262.
101. 2026.	119. \$ 14170.70.	137. \$ 32545.24.
102. 16986.	120. 2815.	138. \$ 24005.79.

**Article 46.**

45. 332.	51. 2213.	78. 192.
46. 223.	52. 1118.	79. 46.65.
47. 205.	53. 1221.	80. 803.153.
48. 222.	54. \$ 325.	81. \$ 391.05.
49. 1114.	76. 309.	82. \$ 55.14.
50. 3212.	77. 192.	83. \$ 338.80.

**Article 48.**

84. 5196.	97. 34456.	109. 5541.
85. 4969.	98. 97820.	110. 26983.
86. 1859.	99. 22968.	111. 11001.
87. 1056.	100. 9903.	112. 107.91.
88. 29962.	101. 9154.	113. 389.
89. 3541.	102. 1.	114. \$ 740.75.
90. 56.39.	103. 6.552.	115. 163864.
91. 14.251.	104. 811.95.	116. \$ 4066.94.
92. \$ 6.27.	105. 9615.5.	117. 269535.
93. \$ 83.96.	106. 78.44.	118. 267369.
94. \$ 95.81.	107. \$ 486.57.	119. 1785837.
95. \$ 29.99.	108. \$ 1836.75.	

**MISCELLANEOUS EXERCISES.**

120.		121.
\$ 190.00	\$ 767.50	\$ 3769.00
131.00	476.25	\$ 1728.00    2648.75
155.25	\$ 291.25, Ans.	1161.93    \$ 6417.75
<u>\$ 476.25</u>		<u>\$ 2889.93</u> 2889.93
		<u>\$ 3527.82, Ans.</u>

**122.**

1882	991	1882	1882
<u>991</u>	<u>431</u>	<u>1422</u>	<u>1602</u>
891, 1st Ans.	1422	460, 2d Ans.	280, 3d Ans.

**123.** \$ 178.50, Sydney.

75.75
<u>\$ 254.25, Albert.</u>
178.50
<u>432.75</u>
80.93
<u>\$ 351.82, Charles.</u>
178.50
<u>\$ 173.32, Ans.</u>

**124.**

1645
635
<u>416</u>
2696
1314
<u>1382, Ans.</u>

**125.**

1575	4563
1658	3233
<u>3233</u>	Ans. <u>1330</u> mi.

**126.** \$ 8555.50

7000.00
9563.75
20000.00
<u>\$ 45119.25</u>

**127.**

362535	847542
104760	467295
<u>467295</u>	<u>380247, Ans.</u>

\$ 50675
<u>45119.25</u>
<u>\$ 5555.75, Ans.</u>

**128.**

\$ 51.75
84.93
267.00
<u>\$ 403.68</u>

\$ 1250.00
403.68
<u>846.32</u>
185.00
<u>\$ 1031.32, Ans.</u>

**Article 58.**

<b>38.</b> 3024.	<b>44.</b> 86415.	<b>50.</b> 49899.71.
<b>39.</b> 13701.	<b>45.</b> 218709.	<b>51.</b> \$ 497.40.
<b>40.</b> 5545.	<b>47.</b> 280.56.	<b>52.</b> \$ 1155.282.
<b>41.</b> 49608.	<b>48.</b> 30.675.	<b>53.</b> \$ 6588.
<b>42.</b> 20496.	<b>49.</b> 3271.8.	<b>54.</b> \$ 76838.76.
<b>43.</b> 5216.		

$$\begin{array}{r}
 81. \quad 763 \\
 \quad 37 \\
 \hline
 5341 \\
 2289 \\
 \hline
 28231, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 82. \quad 1345 \\
 \quad 45 \\
 \hline
 6725 \\
 5380 \\
 \hline
 60525, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 83. \quad 406 \\
 \quad 25 \\
 \hline
 2030 \\
 812 \\
 \hline
 10150, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 84. \quad 1621 \\
 \quad 34 \\
 \hline
 6484 \\
 4863 \\
 \hline
 55114, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 85. \quad 134.7 \\
 \quad 86 \\
 \hline
 8082 \\
 10776 \\
 \hline
 11584.2, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 86. \quad 17.58 \\
 \quad 285 \\
 \hline
 8790 \\
 14064 \\
 \hline
 3516 \\
 5010.30, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 87. \quad 3.049 \\
 \quad 329 \\
 \hline
 27441 \\
 6098 \\
 \hline
 9147 \\
 1003.121, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 88. \quad 25.75 \\
 \quad 703 \\
 \hline
 7725 \\
 18025 \\
 \hline
 18102.25, \text{ Ans.}
 \end{array}$$

**Article 60.**

<b>89.</b> 347	<b>90.</b> 826	<b>91.</b> 90.4
769	243	85
<u>3123</u>	<u>2478</u>	<u>4520</u>
2082	3304	7232
<u>2429</u>	<u>1652</u>	<u>7684.0, Ans.</u>
266843, Ans.	200718, Ans.	

$$\begin{array}{r}
 92. \$32.13 \\
 \quad 91 \\
 \hline
 \quad 3213 \\
 28917 \\
 \hline
 \$2923.83, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 93. 456.7 \\
 \quad 68 \\
 \hline
 \quad 36536 \\
 27402 \\
 \hline
 31055.6, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 94. 8.901 \\
 \quad 542 \\
 \hline
 \quad 17802 \\
 35604 \\
 \hline
 44505 \\
 \hline
 4824.342, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 95. \$23.45 \\
 \quad 397 \\
 \hline
 \quad 16415 \\
 21105 \\
 \hline
 \quad 7035 \\
 \hline
 \$9309.65, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 96. 6789.0 \\
 \quad 645 \\
 \hline
 \quad 339450 \\
 271560 \\
 \hline
 407340 \\
 \hline
 4378905.0, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 97. \$198.06 \\
 \quad 805 \\
 \hline
 \quad 99030 \\
 158448 \\
 \hline
 \$159438.30, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 98. 45.32 \\
 \quad 907 \\
 \hline
 \quad 31724 \\
 40788 \\
 \hline
 41105.24, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 99. 982.4 \\
 \quad 3004 \\
 \hline
 \quad 39296 \\
 29472 \\
 \hline
 2951129.6, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 100. \$60.51 \\
 \quad 768 \\
 \hline
 \quad 48408 \\
 36306 \\
 \hline
 42357 \\
 \hline
 \$46471.68, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 101. 87.35 \\
 \quad 94 \\
 \hline
 \quad 34940 \\
 78615 \\
 \hline
 8210.90, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 102. \$80.42 \\
 \quad 832 \\
 \hline
 \quad 16084 \\
 24126 \\
 \hline
 64336 \\
 \hline
 \$66909.44, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 103. 30.69 \\
 \quad 907 \\
 \hline
 \quad 21483 \\
 27621 \\
 \hline
 27835.83, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 104. \$817.42 \\
 \quad 358 \\
 \hline
 \quad 653936 \\
 408710 \\
 \hline
 245226 \\
 \hline
 \$292636.36, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 105. 8.439 \\
 \quad 125 \\
 \hline
 \quad 42195 \\
 16878 \\
 \hline
 8439 \\
 \hline
 1054.875, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 106. 86491 \\
 \quad 683 \\
 \hline
 \quad 259473 \\
 691928 \\
 \hline
 518946 \\
 \hline
 59073353, \text{ Ans.}
 \end{array}$$

<b>107.</b> 49382 <u>294</u> 197528 444438 <u>98764</u> 14518308, Ans.	<b>108.</b> \$ 887.95 <u>761</u> 88795 532770 <u>621565</u> \$ 675729.95, Ans.	<b>109.</b> 4963 <u>845</u> 24815 19852 <u>39704</u> 4193735, Ans.
<b>110.</b> \$ 28.59 <u>927</u> 20013 5718 <u>25731</u> \$ 26502.93, Ans.	<b>111.</b> 938.42 <u>347</u> 656894 375368 <u>281526</u> 325631.74, Ans.	<b>112.</b> 61904 <u>869</u> 557136 371424 <u>495232</u> 53794576, Ans.
<b>113.</b> \$ 329.87 <u>35</u> 164935 <u>98961</u> \$ 11545.45, Ans.	<b>114.</b> 42935 <u>942</u> 85870 171740 <u>386415</u> 40444770, Ans.	<b>115.</b> \$ 864.23 <u>346</u> 518538 345692 <u>259269</u> \$ 299023.58, Ans.
<b>116.</b> 84917 <u>809</u> 764253 679336 <u>68697853</u> , Ans.	<b>117.</b> \$ 73.24 <u>935</u> 36620 21972 <u>65916</u> \$ 68479.40, Ans.	<b>118.</b> \$ 98.983 <u>871</u> 98983 692881 <u>791864</u> \$ 86214.193, Ans.
<b>119.</b> 295 <u>163</u> 885 1770 <u>295</u> 48085 lbs., Ans.	<b>120.</b> 1468 <u>87</u> 10276 11744 <u>127716</u> , Ans.	<b>121.</b> 681 <u>507</u> 4767 3405 <u>345267</u> 12 690534 345267 <u>4143204</u> , Ans.

<b>122.</b> 804.51	<b>123.</b> 914.08	<b>124.</b> \$82.50
63	64	25
<u>241353</u>	<u>365632</u>	<u>41250</u>
482706	548448	16500
<u>50684.13</u> , Ans.	<u>58501.12</u> , Ans.	<u>\$2062.50</u> , Ans.

<b>125.</b> 5414.015	<b>126.</b> 8304.5	<b>127.</b> 7038.61
38	77	126
<u>43312120</u>	<u>581315</u>	<u>4223166</u>
16242045	581315	1407722
<u>205732.57</u> , Ans.	<u>639446.5</u> , Ans.	<u>703861</u>
		<u>886864.86</u> , Ans.

<b>128.</b> 824.84	<b>129.</b> \$62.005	<b>130.</b> \$47.168
424	91	208
<u>329936</u>	<u>62005</u>	<u>377344</u>
164968	558045	94336
<u>329936</u>	<u>\$5642.455</u> , Ans.	<u>\$9810.944</u> , Ans.
<u>349732.16</u> , Ans.		

<b>131.</b> \$617.43	<b>132.</b> 5634	<b>133.</b> 965.13
355	47	3705
<u>308715</u>	<u>39438</u>	<u>482565</u>
308715	22536	675591
<u>185229</u>	Ans. <u>264798</u> bu.	<u>289539</u>
<u>\$219187.65</u> , Ans.		<u>3575806.65</u> , Ans.

**135.** 473970.

**136.** 7854000; 138000.

### Article 61.

<b>138.</b> 814000.	<b>142.</b> \$67244.10.	<b>146.</b> 27306000.
<b>139.</b> 274470.	<b>143.</b> 2760720.	<b>147.</b> \$23364000.
<b>140.</b> 493020.	<b>144.</b> \$3208100.	<b>148.</b> 16320000 mi.
<b>141.</b> 603900.	<b>145.</b> 2051636.8.	<b>149.</b> 4992000 acres.



## MISCELLANEOUS EXERCISES.

150.

\$ 19.50

8

\$ 156.00, cost of feed.

170.00 " flour.

63.25 " oats.

\$ 389.25

\$ 8.50

20

\$ 170.00, cost of flour. \$ 110.75, Ans.

\$ 500

389.25

151.

416

3

1248, wounded.

416

1664, total loss of army.

5

8320, enemy's loss.

1664

9984, Ans.

152.

\$ 4.25

52

850

2125

\$ 221.00, cost of board.

\$ 1.30

52

260

650

\$ 67.60, cost of cigars, etc.

\$ 221.00, board.

150.00, expenses.

67.60, cigars, etc.

\$ 438.60, spent.

\$ 1500.00

438.60

\$ 1061.40, saved.

67.60

Ans. \$ 1129.00, what he could have saved.

153.

31.50

16.25

15.25 mi. apart in 1 hour.

48

12200

6100

Ans. 732.00 mi. apart in 48 hours.

154.

1360

120

27200

1360

Ans. 163200 lb.

## 155.

56		85
29		29
<u>27</u> girls.		<u>765</u>
79		170
243		<u>2465</u> lb., weight of boys.
189		2133
<u>2133</u> lb., weight of girls.	Ans.	<u>4598</u> lb.

## 156.

\$ 3.75	\$ 573.95
130	487.50
<u>11250</u>	Ans. \$ 86.45, gain.
375	
<u>\$ 487.50</u> , cost of cloth.	

## 157.

842	842
796	796
<u>46</u> , dif.	<u>1638</u>
2	92
<u>92</u>	<u>3276</u>
	14742
	<u>150696</u> , Ans.

## 158.

\$ 31.50	\$ 4.25
40	22
<u>\$ 1260.00</u>	<u>850</u>
	850
	<u>\$ 93.50</u>
\$ 1260.00, cost of boards.	
93.50 " shingles.	
<u>\$ 1353.50</u> , Ans.	

## 159.

\$ 2500	\$ 75
1900	60
<u>\$ 4400</u>	<u>\$ 4500</u> , cost of land.
	\$ 4500
	4400
	<u>\$ 100</u> , Ans.

## 160.

\$ 2.75	\$ 1.80
17	114
<u>1925</u>	<u>720</u>
275	180
\$ 46.75	180
	<u>\$ 205.20</u>

\$ 46.75, cost of silk.

205.20 " carpet.

17.00 " lining.

\$ 268.95, Ans.

162. 325 \$ 1.65

24 1.48

1300 .17, gain on 1 bu.

650

7800 bu.

.17

54600

7800

Ans. \$ 1326.00, gain.

## 161.

\$ 50	\$ 4.25
60	120
<u>\$ 3000</u>	<u>8500</u>
	425
\$ 50	<u>\$ 510.00</u>
20	
<u>\$ 1000</u> , ret.	

\$ 45.50

\$ 125

28

5

36400\$ 625

9100

\$ 1274.00, cost of cows.

3000

" oxen.

510

" sheep.

625

" horses.

\$ 5409

1000

\$ 4409, Ans.

## Article 71.

36. 383.

41. 12.23.

47. 612 $\frac{3}{4}$ .52. 4.348 $\frac{5}{8}$ .

37. 821.

42. 11.90.

48. 8423 $\frac{1}{4}$ .

53. 405.

38. 971.

43. 4.467.

49. 673 $\frac{1}{2}$ .54. 205 $\frac{3}{4}$  mi.

39. 1142.

45. 715 $\frac{1}{2}$ .

50. 13.34.

55. \$ 5.45.

40. 58.6.

46. 678 $\frac{7}{8}$ .51. 60.71 $\frac{1}{8}$ .56. 2313 $\frac{3}{8}$ .

## Article 72.

69. 470 $\frac{1}{4}$ .71. 1359 $\frac{1}{3}$ .

73. 1.063.

70. 234.

72. 5.63.

74. 50.5.

**Article 74.****76.** \$ 3.18, Ans.**77.** \$ 32.02, Ans.**78.**990<sup>34</sup><sub>351</sub>, Ans.

351 ) 347692

3159

3179

3159

202

**79.**10.67<sup>78</sup><sub>793</sub>, Ans.

793 ) 8468.31

793

5383

4758

6251

5551

700

**80.**965<sup>54</sup><sub>982</sub>, Ans.

982 ) 947684

8838

6388

5892

4964

4910

54

**81.**4.47<sup>38</sup><sub>735</sub>, Ans.

735 ) 3287.64

2940

3476

2940

5364

5145

219

**82.**5.509<sup>334</sup><sub>1234</sub>, Ans.

1234 ) 6798.341

6170

6283

6170

11341

11106

235

**83.**\$ 8.503<sup>15</sup><sub>987</sub>, Ans.

987 ) \$ 8392.476

7896

4964

4935

2976

2961

15

84.

$$\begin{array}{r}
 505\cancel{4848}, \text{ Ans.} \\
 5942 \overline{) 3004760} \\
 \underline{29710} \phantom{0} \\
 33760 \\
 \underline{29710} \phantom{0} \\
 4050
 \end{array}$$

85.

$$\begin{array}{r}
 1487\cancel{878}, \text{ Ans.} \\
 873 \overline{) 1298763} \\
 \underline{873} \phantom{00} \\
 4257 \\
 \underline{3492} \phantom{0} \\
 7656 \\
 \underline{6984} \phantom{0} \\
 6723 \\
 \underline{6111} \phantom{0} \\
 612
 \end{array}$$

86.

$$\begin{array}{r}
 75\cancel{375}, \text{ Ans.} \\
 841 \overline{) 63450} \\
 \underline{5887} \phantom{0} \\
 4580 \\
 \underline{4205} \phantom{0} \\
 375
 \end{array}$$

87.

$$\begin{array}{r}
 2.056\cancel{706}, \text{ Ans.} \\
 2007 \overline{) 4127.098} \\
 \underline{4014} \phantom{00} \\
 11309 \\
 \underline{10035} \phantom{0} \\
 12748 \\
 \underline{12042} \phantom{0} \\
 706
 \end{array}$$

89.

$$643 \times 857 = 551051$$

88.

$$\begin{array}{r}
 8.75\cancel{424}, \text{ Ans.} \\
 987 \overline{) 8643.21} \\
 \underline{7896} \phantom{00} \\
 7472 \\
 \underline{6909} \phantom{00} \\
 5631 \\
 \underline{4935} \phantom{00} \\
 696
 \end{array}$$

$$\begin{array}{r}
 1208\cancel{228}, \text{ Ans.} \\
 456 \overline{) 551051} \\
 \underline{456} \phantom{00} \\
 950 \\
 \underline{912} \phantom{00} \\
 3851 \\
 \underline{3648} \phantom{00} \\
 203
 \end{array}$$

90.  $984 \times 895 = 880680$ .

$$2453\frac{53}{55}, \text{ Ans.}$$

359 ) 880680

$$\begin{array}{r}
 718 \\
 \hline
 1626 \\
 1436 \\
 \hline
 1908 \\
 1795 \\
 \hline
 1130 \\
 1077 \\
 \hline
 53
 \end{array}$$

91.  $8964 \times 73 = 654372$ .

$$6888\frac{12}{13}, \text{ Ans.}$$

95 ) 654372

$$\begin{array}{r}
 570 \\
 \hline
 843 \\
 760 \\
 \hline
 837 \\
 760 \\
 \hline
 772 \\
 760 \\
 \hline
 12
 \end{array}$$

92. \$125, Ans.

85 ) \$10625

$$\begin{array}{r}
 85 \\
 \hline
 212 \\
 170 \\
 \hline
 425 \\
 425 \\
 \hline
 \end{array}$$

93. 24, Ans.

\$225 ) \$5400

$$\begin{array}{r}
 450 \\
 \hline
 900 \\
 900 \\
 \hline
 \end{array}$$

94. \$6848.76 $\frac{2}{3}$ , Ans.

98 ) \$671178.90

$$\begin{array}{r}
 588 \\
 \hline
 831 \\
 784 \\
 \hline
 477 \\
 392 \\
 \hline
 858 \\
 784 \\
 \hline
 749 \\
 686 \\
 \hline
 630 \\
 588 \\
 \hline
 42
 \end{array}$$

95. 26 $\frac{10}{11}$ , Ans.

115 ) 3000

$$\begin{array}{r}
 230 \\
 \hline
 700 \\
 690 \\
 \hline
 10
 \end{array}$$

96. 3.44 $\frac{11}{12}$ , Ans.

512 ) 1763.68

$$\begin{array}{r}
 1536 \\
 \hline
 2276 \\
 2048 \\
 \hline
 2288 \\
 2048 \\
 \hline
 240
 \end{array}$$

97.

$$\begin{array}{r}
 3007, \text{ Ans.} \\
 2135 \overline{) 6419945} \\
 \underline{6405} \phantom{00} \\
 14945 \\
 \underline{14945} \\
 0
 \end{array}$$

98.

$$\begin{array}{r}
 114.52, \text{ Ans.} \\
 432 \overline{) 49300} \\
 \underline{432} \phantom{00} \\
 610 \\
 \underline{432} \phantom{00} \\
 1780 \\
 \underline{1728} \phantom{00} \\
 52
 \end{array}$$

99.

$$\begin{array}{r}
 342, \text{ Ans.} \\
 2047 \overline{) 700074} \\
 \underline{6141} \phantom{00} \\
 8597 \\
 \underline{8188} \phantom{00} \\
 4094 \\
 \underline{4094} \\
 0
 \end{array}$$

100.

$$\begin{array}{r}
 \$ 52.88, \text{ Ans.} \\
 108 \overline{) \$ 5711.04} \\
 \underline{540} \phantom{00} \\
 311 \\
 \underline{216} \phantom{00} \\
 950 \\
 \underline{864} \phantom{00} \\
 864 \\
 \underline{864} \\
 0
 \end{array}$$

101.

$$\begin{array}{r}
 \$ 136\frac{1}{2}, \text{ Ans.} \\
 365 \overline{) \$ 50000} \\
 \underline{365} \phantom{00} \\
 1350 \\
 \underline{1095} \phantom{00} \\
 2550 \\
 \underline{2190} \phantom{00} \\
 360
 \end{array}$$

103.

$$\begin{array}{r}
 61.87\frac{1}{2}, \text{ Ans.} \\
 44 \overline{) 2722.50} \\
 \underline{264} \phantom{00} \\
 82 \\
 \underline{44} \phantom{00} \\
 385 \\
 \underline{352} \phantom{00} \\
 330 \\
 \underline{308} \phantom{00} \\
 22
 \end{array}$$

**104.**

$$\begin{array}{r}
 106.558\frac{1}{3}, \text{ Ans.} \\
 86 \overline{) 9164.000} \\
 \underline{86} \phantom{000} \\
 564 \phantom{00} \\
 \underline{516} \phantom{00} \\
 480 \phantom{00} \\
 \underline{430} \phantom{00} \\
 500 \phantom{00} \\
 \underline{430} \phantom{00} \\
 700 \phantom{00} \\
 \underline{688} \phantom{00} \\
 12
 \end{array}$$

**105.**

$$\begin{array}{r}
 \$ 31.25, \text{ Ans.} \\
 404 \overline{) \$ 12625.00} \\
 \underline{1212} \phantom{00} \\
 505 \phantom{00} \\
 \underline{404} \phantom{00} \\
 1010 \phantom{00} \\
 \underline{808} \phantom{00} \\
 2020 \phantom{00} \\
 \underline{2020}
 \end{array}$$

**106.**

$$\begin{array}{r}
 137.125, \text{ Ans.} \\
 128 \overline{) 17552.000} \\
 \underline{128} \phantom{000} \\
 475 \phantom{00} \\
 \underline{384} \phantom{00} \\
 912 \phantom{00} \\
 \underline{896} \phantom{00} \\
 160 \phantom{00} \\
 \underline{128} \phantom{00} \\
 320 \phantom{00} \\
 \underline{256} \phantom{00} \\
 640 \phantom{00} \\
 \underline{640}
 \end{array}$$

**107.**

$$\begin{array}{r}
 30303\frac{1}{3}, \text{ Ans.} \\
 33 \overline{) 1000000} \\
 \underline{99} \phantom{000} \\
 100 \phantom{00} \\
 \underline{99} \phantom{00} \\
 100 \phantom{00} \\
 \underline{99} \phantom{00} \\
 1
 \end{array}$$

**Article 75.****110.** \$ 19.65.**112.** 45.54.**111.** 39.62 ; 3.962.**113.** 137 $\frac{1}{3}$ .



114. 1090.18 ~~1888~~<sub>8488</sub>, Ans.

54.00 ) 58869.90

$$\begin{array}{r}
 54 \\
 \hline
 486 \\
 486 \\
 \hline
 99 \\
 54 \\
 \hline
 450 \\
 432 \\
 \hline
 18
 \end{array}$$

115.

28 ~~2272~~<sub>81000</sub>, Ans.

51|000 ) 1437|272

$$\begin{array}{r}
 102 \\
 \hline
 417 \\
 408 \\
 \hline
 9272
 \end{array}$$

116.

494 ~~18888~~<sub>18888</sub> sec., Ans.

186|000 ) 92000|000

$$\begin{array}{r}
 744 \\
 \hline
 1760 \\
 1674 \\
 \hline
 860 \\
 744 \\
 \hline
 116000
 \end{array}$$

117.

1024 ~~8448~~<sub>8448</sub>, Ans.

8291 ) 8496453

$$\begin{array}{r}
 8291 \\
 \hline
 20545 \\
 16582 \\
 \hline
 39633 \\
 33164 \\
 \hline
 6469
 \end{array}$$

119.

58881 ~~148~~<sub>1234</sub>, Ans.

1234 ) 72659302

$$\begin{array}{r}
 6170 \\
 \hline
 10959 \\
 9872 \\
 \hline
 10873 \\
 9872 \\
 \hline
 10010 \\
 9872 \\
 \hline
 1382 \\
 1234 \\
 \hline
 148
 \end{array}$$

118.

768 ~~3478~~<sub>3788</sub>, Ans.

3782 ) 2907654

$$\begin{array}{r}
 26474 \\
 \hline
 26025 \\
 22692 \\
 \hline
 33334 \\
 30256 \\
 \hline
 3078
 \end{array}$$

**120.**11956~~1111~~<sub>1111</sub>, Ans.

5678 ) 67890123

$$\begin{array}{r}
 5678 \\
 \hline
 11110 \\
 5678 \\
 \hline
 54321 \\
 51102 \\
 \hline
 32192 \\
 28390 \\
 \hline
 38023 \\
 34068 \\
 \hline
 3955
 \end{array}$$

**121.**1.542~~1111~~<sub>1111</sub>, Ans.

2961 ) 4567.890

$$\begin{array}{r}
 2961 \\
 \hline
 16068 \\
 14805 \\
 \hline
 12639 \\
 11844 \\
 \hline
 7950 \\
 5922 \\
 \hline
 2028
 \end{array}$$

**122.**.529~~111~~<sub>111</sub>, Ans.

349 ) 184.837

$$\begin{array}{r}
 1745 \\
 \hline
 1033 \\
 698 \\
 \hline
 3357 \\
 3141 \\
 \hline
 216
 \end{array}$$

**123.**977~~1111~~<sub>1111</sub>, Ans.

6384 ) 6239076

$$\begin{array}{r}
 57456 \\
 \hline
 49347 \\
 44688 \\
 \hline
 46596 \\
 44688 \\
 \hline
 1908
 \end{array}$$

**124.**1.788~~111~~<sub>111</sub>, Ans.

945 ) 1689.783

$$\begin{array}{r}
 945 \\
 \hline
 7447 \\
 6615 \\
 \hline
 8328 \\
 7560 \\
 \hline
 7683 \\
 7560 \\
 \hline
 123
 \end{array}$$

**125.**

$849 \times 863 = 732687.$

585~~111~~<sub>111</sub>, Ans.

1252 ) 732687

$$\begin{array}{r}
 6260 \\
 \hline
 10668 \\
 10016 \\
 \hline
 6527 \\
 6260 \\
 \hline
 267
 \end{array}$$

**126.**

$$84 \times 96 \times 25 = 201600$$

$$169\frac{452}{1189}, \text{ Ans.}$$

$$1189 \overline{) 201600}$$

$$\begin{array}{r} 1189 \\ \underline{8270} \\ 7134 \\ \underline{11360} \\ 10701 \\ \underline{659} \end{array}$$

**127.**

$$694 \times 87 + 956 = 61334$$

$$100\frac{434}{609}, \text{ Ans.}$$

$$609 \overline{) 61334}$$

$$\begin{array}{r} 609 \\ \underline{434} \end{array}$$

**129.**

$$9008 \times 7080 = 63776640$$

$$30515\frac{220}{2090}, \text{ Ans.}$$

$$2090 \overline{) 63776640}$$

$$\begin{array}{r} 627 \\ \underline{1076} \\ 1045 \\ \underline{316} \\ 209 \\ \underline{1074} \\ 1045 \\ \underline{290} \end{array}$$

**128.**

$$847 \times 12 \times 900 = 9147600$$

$$\begin{array}{r} 9 \overline{) 9147600} \\ 1016400, \text{ Ans.} \end{array}$$

**130.**

$$\$1.11\frac{215}{850}, \text{ Ans.}$$

$$850 \overline{) \$945.65}$$

$$\begin{array}{r} 850 \\ \underline{956} \\ 850 \\ \underline{1065} \\ 850 \\ \underline{215} \end{array}$$

**131.**

$$843 - 159 = 684$$

$$29 \times 7 = 203$$

$$203 \overline{) 684} (3\frac{75}{203}, \text{ Ans.}$$

$$\begin{array}{r} 609 \\ \underline{75} \end{array}$$

**132.**

$$\$ .871\frac{975}{975}, \text{ Ans.}$$

$$975 \overline{) \$849.625}$$

$$\begin{array}{r} 7800 \\ \underline{6962} \\ 6825 \\ \underline{1375} \\ 975 \\ \underline{400} \end{array}$$

## MISCELLANEOUS EXERCISES.

$$133. \quad \$3 \overline{) \$7665} \\ \underline{2555} \text{ bbl., Ans.}$$

$$134. \quad \begin{array}{r} 25 \\ 31 \\ \hline 56 \end{array} \text{ miles apart in 1 day.}$$

101 days, Ans.

$$56 \overline{) 5656}$$

$$\underline{56}$$

$$\underline{56}$$

$$\underline{56}$$

$$135. \quad \begin{array}{r} 2240 \\ 2000 \\ \hline 240 \end{array} \quad \begin{array}{r} 240 \\ 25 \\ \hline 1200 \end{array}$$

$$2000 \overline{) 6000} \\ \underline{3} \text{ short tons, Ans.}$$

$$\begin{array}{r} 480 \\ \hline 6000 \text{ lb., gain.} \end{array}$$

136.

$$\begin{array}{r} \$34 \quad \$20.40 \quad \$1734 \quad 75 \\ 75 \quad 85 \quad 2550 \quad 85 \quad \$26.77 \text{ Ans.} \\ \hline 170 \quad 10200 \quad \$4284 \quad 160 \overline{) \$4284.00} \\ 238 \quad 16320 \\ \hline \$2550 \quad \$1734.00 \end{array}$$

$$\begin{array}{r} 320 \\ \hline 1084 \\ 960 \\ \hline 1240 \\ 1120 \\ \hline 1200 \\ 1120 \\ \hline 80 \end{array}$$

$$137. \quad \begin{array}{r} 14, \text{ Ans.} \\ \$15 \quad \$180 \overline{) \$2520} \\ 12 \quad 180 \\ \hline 30 \quad 720 \\ 15 \quad 720 \\ \hline \$180 \end{array}$$

$$138. \quad \begin{array}{r} 640, \text{ Ans.} \\ 15 \overline{) 9600} \\ 90 \\ \hline 60 \\ 60 \end{array}$$

<b>139.</b> $\$3286 \quad \$6 \overline{) \$636}$ $\underline{2650}$ $\$636, \text{ gain.}$	$\underline{106, \text{ Ans.}}$	<b>140.</b> $15 \quad 525 \overline{) 33600}$ $\underline{35}$ $\underline{75}$ $\underline{45}$ $\underline{525}$	<b>64, Ans.</b> $\underline{3150}$ $\underline{2100}$ $\underline{2100}$
--	---------------------------------	---	---

<b>141.</b> 35 States, Ans. $78 \overline{) 00} \quad 2744 \overline{) 00}$ $\underline{234}$ $\underline{404}$ $\underline{390}$ $\underline{1400 \text{ sq. mi. over.}}$	<b>142.</b> 750, Ans. $35 \overline{) 0} \quad 26250 \overline{) 0}$ $\underline{245}$ $\underline{175}$ $\underline{175}$
---	--

<b>143.</b> 56 acres. $\$8 \overline{) 0} \quad \$448 \overline{) 0}$ $\underline{40}$ $\underline{48}$ $\underline{48}$	$\underline{164}$ $\underline{56}$ $\underline{108, \text{ Ans.}}$	<b>144.</b> 71, Ans. $1002 \overline{) 71142}$ $\underline{7014}$ $\underline{1002}$ $\underline{1002}$
--	--	---

$\underline{159}$ $\underline{\$5}$ $\$795, \text{ cost of wood.}$	<b>145.</b> $\underline{\$795}$ $\underline{144}$ $\underline{\$651}$	$\$3 \overline{) \$651}$ $\underline{217 \text{ sheep, Ans.}}$
--	--	---

**Article 76.**

<b>33.</b> 55405 $\underline{52198}$ $\underline{3207, \text{ Ans.}}$	<b>34.</b> 74760 $\underline{34943}$ $\underline{39817, \text{ Ans.}}$	<b>35.</b> 5496 $\underline{4004}$ $\underline{1492, \text{ Ans.}}$
<b>36.</b> $\underline{\$2560.75}$ $\underline{375.87}$ $\underline{\$2936.62}$	$\underline{\$5000.00}$ $\underline{2936.62}$ $\underline{\$2063.38, \text{ Ans.}}$	<b>37.</b> 664 $\underline{19}$ $\underline{5976}$ $\underline{664}$ $\underline{12616, \text{ Ans.}}$

**38.**

\$ 7896.84  
 5670.00  
\$ 2226.84, gain.

6 ) \$ 2226.84  
\$ 371.14, Ans.

**39.**

\$ 0.11                      255  
 0.09                      3  
\$ 0.02, gain on 1 lb.    765 lb.  
                               \$ 0.02  
\$ 15.30, Ans.

**40.**

223  
 61  
162 miles.

6 days, Ans.

27 ) 162  
162

**41.**

\$ 97  
 365  
485

582

291  
\$ 35405, Ans.

**42.**

596  
 48  
4768

2384

28608

10  
28618, Ans.

**43.**

\$ 0.15	\$ 0.28	\$ 0.76	\$ 2.55
17	46	16	12.88
<u>105</u>	<u>168</u>	<u>456</u>	<u>12.16</u>
15	112	76	\$ 27.59
<u>\$ 2.55</u>	<u>\$ 12.88</u>	<u>\$ 12.16</u>	

\$ 0.14, Ans.

\$ 42.57  
 27.59  
\$ 14.98

107 ) \$ 14.98

10 7  
4 28  
 4 28

**44.**

\$ 0.24  $\frac{3}{16}$ , Ans.

\$ 1549.60  
 1472.50  
\$ 77.10, gain.

310 ) \$ 77.10

62 0  
15 10  
12 40  
 2 70

			45.		\$4.71 $\frac{1}{3}$ , Ans.
\$12	\$15	144	\$18	252)	\$1188.00
144	108	108	252		1008
<u>48</u>	<u>120</u>	252 acres.	36		1800
48	15		90		1764
12	\$1620		36		360
\$1728	1728		\$4536		252
	\$3348, cost.		3348		108
			\$1188, gain.		

46.		47.
27, Ans.		\$8, Ans.
407)10989	\$1728	288)\$2304
814	576	2304
<u>2849</u>	\$2304, sold for.	
2849		

48.		
\$5100	\$2013	\$5815.80
715.80	1981.95	3994.95
\$5815.80	\$3994.95, paid.	\$1820.85, Ans.

49.  $194 + 65 = 259$ ;  $259 \times 7 = 1813$ .

$$\frac{352 - 220}{11} = \frac{132}{11} = 12,$$

$1813 + 12 = 1825$ ;  $1825 - 952 = 873$ , Ans.

50.			
\$5.75	\$9.25	\$21.50	\$2875.00, cost of flour.
500	47	15	434.75, " cheese.
\$2875.00	6475	10750	322.50, " pork.
	3700	2150	\$3632.25, Ans.
	\$434.75	\$322.50	

51.

$$\begin{array}{r}
 \$9212 \quad 137\frac{1}{2} \text{ hhd., Ans.} \\
 20 \quad \$67) \$9232 \\
 \hline
 \$9232 \quad 67 \\
 \quad 253 \\
 \quad 201 \\
 \quad \hline
 \quad 522 \\
 \quad 469 \\
 \quad \hline
 \quad 53
 \end{array}$$

52.

$$\begin{array}{r}
 2240 \quad 13\frac{1}{2} \text{ Ans.} \\
 2000 \quad 2240) 30000 \\
 \hline
 240 \text{ lb.} \quad 2240 \\
 \quad 125 \quad 7600 \\
 \quad 240 \quad 6720 \\
 \quad \hline
 \quad 5000 \quad 880 \\
 \quad 250
 \end{array}$$

Gain, 30000 lb.

53. 19 horses, Ans.

$$\begin{array}{r}
 \$150) \$2973 \\
 150 \\
 \hline
 1473 \\
 1350 \\
 \hline
 123
 \end{array}$$

Ans. \$123 for the carriage.

54.

$$\begin{array}{r}
 7781 \\
 31 = 251. \\
 251 + 549 = 800. \\
 (2128 \div 7) \times 2 = 608. \\
 800 - 608 = 192, \text{ Ans.}
 \end{array}$$

55.

$$\begin{array}{l}
 194 + 65 = 259; 259 \times 7 = 1813. \\
 352 - 220 = 132; 132 \div 11 = 12. \\
 1813 + 12 = 1825. \\
 91 - 35 = 56. \\
 952 \div 56 = 17. \\
 1825 - 17 = 1808, \text{ Ans.}
 \end{array}$$

56.

$$\begin{array}{r}
 \$63 \quad \$45.50 \\
 125 \quad 360 \\
 \hline
 315 \quad 273000 \\
 126 \quad 13650 \\
 63 \quad \hline
 \$7875 \quad \$16380.00 \\
 1368 \quad 9243 \\
 \hline
 \$9243 \quad \$7137, \text{ Ans.}
 \end{array}$$

57.

17, Ans.

$$\begin{array}{r}
 150 \quad 24|00) 408|00 \\
 16 \quad 24 \\
 \hline
 900 \quad 168 \\
 150 \quad 168 \\
 \hline
 2400
 \end{array}$$

58.

759, Ans.

$$\begin{array}{r}
 18988 \quad 25) 18975 \\
 13 \quad 175 \\
 \hline
 18975 \quad 147 \\
 \quad 125 \\
 \quad \hline
 \quad 225 \\
 \quad 225 \\
 \quad \hline
 \quad 0
 \end{array}$$



59.

$$\begin{array}{r}
 320 \quad 5280 \quad 550, \text{ Ans.} \\
 160 \quad 100 \quad 96 \overline{) 0} \quad 52800 \overline{) 0} \\
 \hline
 480 \quad 528000 \text{ ft.} \quad 480 \\
 2 \quad 480 \\
 \hline
 960 \text{ ft.} \quad 480
 \end{array}$$

60.  $\$37 + \$51 = \$88.$ 

$$\begin{array}{r}
 17, \text{ Ans.} \\
 \$88 \overline{) \$1496} \\
 \hline
 88 \\
 \hline
 616 \\
 \hline
 616
 \end{array}$$

61.

$$\begin{array}{r}
 \$520 \quad \$520 \\
 216 \overline{) \$112320} \quad 519 \\
 \hline
 1080 \quad 4680 \\
 \hline
 432 \quad 520 \\
 \hline
 432 \quad 2600 \\
 \hline
 \$269880, \text{ Ans.}
 \end{array}$$

62.

$$\begin{array}{r}
 1160 \quad 11 \text{ 60 lb., Ans.} \\
 . \quad 2 \quad \$ .38 \overline{) \$440.80} \\
 \hline
 2320 \quad 38 \\
 \hline
 \$ .19 \quad 60 \\
 \hline
 20880 \quad 38 \\
 \hline
 2320 \quad 228 \\
 \hline
 \$440.80 \quad 228
 \end{array}$$

63.

$$\begin{array}{r}
 \$11 \quad \$155 \quad \$5 \quad \$165, \text{ cost of hay.} \quad \$3038 \quad 13, \text{ Ans.} \\
 15 \quad 3 \quad 375 \quad 465, \text{ " oxen.} \quad 2505 \quad \$41 \overline{) \$533} \\
 \hline
 55 \quad \$465 \quad 25 \quad 1875, \text{ " sheep.} \quad \$533 \quad 41 \\
 11 \quad 35 \quad \$2505 \quad 123 \\
 \hline
 \$165 \quad 15 \quad 123 \\
 \hline
 \$1875 \quad 123
 \end{array}$$

64.

$$\begin{array}{r}
 \$7600 \quad \$3775 \quad \$15200 \quad 2 \quad 6 \overline{) \$34902} \\
 2 \quad 3 \quad 11325 \quad 1 \quad \$5817, \text{ Ans.} \\
 \hline
 \$15200 \quad \$11325 \quad 1500 \quad 3 \\
 \hline
 6877 \quad 6 \text{ heirs.} \\
 \hline
 \$34902
 \end{array}$$

65.

$$\begin{array}{r} \$2.40 \\ 17 \\ \hline 1680 \\ 240 \\ \hline \$40.80 \end{array} \quad 9) \$40.80$$

\$4.53 $\frac{3}{4}$ , Ans.

66.

$$\begin{array}{r} 160 \\ \$5 \\ \hline \$800 \end{array} \quad \begin{array}{r} \$965 \\ 800 \\ \hline \$165 \end{array} \quad \begin{array}{r} \$3) \$165 \\ 55 \text{ tons.} \\ \hline 160 \\ 55 \\ \hline \text{Ans. } 215 \text{ tons.} \end{array}$$

67.

$$\begin{array}{r} 5) 960 \\ 192 \\ \hline \$12 \\ 384 \\ 192 \\ \hline \$2304 \end{array} \quad \begin{array}{r} 3) 960 \\ 320 \\ \hline \$15 \\ 1600 \\ 320 \\ \hline \$4800 \end{array} \quad \begin{array}{r} 192 \\ 320 \\ \hline 512 \text{ acres.} \\ 448 \\ \$20 \\ \hline \$8960 \end{array} \quad \begin{array}{r} 960 \\ 512 \\ \hline 448 \\ \$20 \\ \hline \$8960 \end{array} \quad \begin{array}{r} \$2304 \\ 4800 \\ 8960 \\ \hline \$16064, \text{ sold for.} \\ 12000, \text{ cost.} \\ \hline \text{Ans. } \$4064, \text{ gain.} \end{array}$$

## Article 82.

8.

$$\begin{array}{r} 2) 84 \\ 2) 42 \\ 3) 21 \\ \hline 7 \end{array} \quad \begin{array}{r} 2) 144 \\ 2) 72 \\ 2) 36 \\ 2) 18 \\ 3) 9 \\ \hline 3 \end{array} \quad \begin{array}{r} 2) 160 \\ 2) 80 \\ 2) 40 \\ 2) 20 \\ 2) 10 \\ \hline 5 \end{array}$$

2<sup>2</sup>, 3, 7. 2<sup>4</sup>, 3<sup>2</sup>. 2<sup>5</sup>, 5, Ans.

9.

$$\begin{array}{r} 2) 462 \\ 3) 231 \\ 7) 77 \\ \hline 11 \end{array} \quad \begin{array}{r} 2) 576 \\ 2) 288 \\ 2) 144 \\ 2) 72 \\ 2) 36 \\ 2) 18 \\ 3) 9 \\ \hline 3 \end{array} \quad \begin{array}{r} 2) 1008 \\ 2) 504 \\ 2) 252 \\ 2) 126 \\ 3) 63 \\ 3) 21 \\ \hline 7 \end{array}$$

Ans. 2, 3, 7, 11. 2<sup>6</sup>, 3<sup>2</sup>. 2<sup>4</sup>, 3<sup>2</sup>, 7.

**Article 83.**

$$\begin{array}{r} 10. \quad 2 \overline{) 210} \\ \quad 3 \overline{) 105} \\ \quad \quad 5 \overline{) 35} \\ \quad \quad \quad 7 \end{array}$$

2, 3, 5, 7, Ans.

$$\begin{array}{r} 11. \quad 2 \overline{) 2772} \\ \quad 2 \overline{) 1386} \\ \quad \quad 3 \overline{) 693} \\ \quad \quad \quad 3 \overline{) 231} \\ \quad \quad \quad \quad 7 \overline{) 77} \\ \quad \quad \quad \quad \quad 11 \end{array}$$

 $2^2, 3^2, 7, 11$ , Ans.

$$\begin{array}{r} 12. \quad 2 \overline{) 426} \\ \quad 3 \overline{) 213} \\ \quad \quad 71 \end{array}$$

2, 3, 71, Ans.

$$\begin{array}{r} 13. \quad 3 \overline{) 6105} \\ \quad 5 \overline{) 2035} \\ \quad \quad 11 \overline{) 407} \\ \quad \quad \quad 37 \end{array}$$

3, 5, 11, 37, Ans.

$$\begin{array}{r} 14. \quad 3 \overline{) 1155} \\ \quad 5 \overline{) 385} \\ \quad \quad 11 \overline{) 77} \\ \quad \quad \quad 7 \end{array}$$

3, 5, 7, 11, Ans.

$$\begin{array}{r} 15. \quad 2 \overline{) 2800} \\ \quad 2 \overline{) 1400} \\ \quad \quad 2 \overline{) 700} \\ \quad \quad \quad 2 \overline{) 350} \\ \quad \quad \quad \quad 5 \overline{) 175} \\ \quad \quad \quad \quad \quad 5 \overline{) 35} \\ \quad \quad \quad \quad \quad \quad 7 \end{array}$$

 $2^4, 5^2, 7$ , Ans.

$$\begin{array}{r} 16. \quad 2 \overline{) 3420} \\ \quad 2 \overline{) 1710} \\ \quad \quad 3 \overline{) 855} \\ \quad \quad \quad 3 \overline{) 285} \\ \quad \quad \quad \quad 5 \overline{) 95} \\ \quad \quad \quad \quad \quad 19 \end{array}$$

 $2^2, 3^2, 5, 19$ , Ans.

$$\begin{array}{r} 17. \quad 2 \overline{) 7800} \\ \quad 2 \overline{) 3900} \\ \quad \quad 2 \overline{) 1950} \\ \quad \quad \quad 3 \overline{) 975} \\ \quad \quad \quad \quad 5 \overline{) 325} \\ \quad \quad \quad \quad \quad 5 \overline{) 65} \\ \quad \quad \quad \quad \quad \quad 13 \end{array}$$

 $2^3, 3, 5^2, 13$ , Ans.

$$\begin{array}{r} 18. \quad 2 \overline{) 16028} \\ \quad 2 \overline{) 8014} \\ \quad \quad 4007 \end{array}$$

 $2^2, 4007$ , Ans.

$$\begin{array}{r} 19. \quad 3 \overline{) 17199} \\ \quad 3 \overline{) 5733} \\ \quad \quad 3 \overline{) 1911} \\ \quad \quad \quad 7 \overline{) 637} \\ \quad \quad \quad \quad 7 \overline{) 91} \\ \quad \quad \quad \quad \quad 13 \end{array}$$

 $3^2, 7^2, 13$ , Ans.

$$\begin{array}{r} 20. \quad 3 \overline{) 10323} \\ \quad 3 \overline{) 3441} \\ \quad \quad 31 \overline{) 1147} \\ \quad \quad \quad 37 \end{array}$$

 $3^2, 31, 37$ , Ans.

$$\begin{array}{r} 21. \quad 2 \overline{) 12496} \\ \quad 2 \overline{) 6248} \\ \quad \quad 2 \overline{) 3124} \\ \quad \quad \quad 2 \overline{) 1562} \\ \quad \quad \quad \quad 11 \overline{) 781} \\ \quad \quad \quad \quad \quad 71 \end{array}$$

 $2^4, 11, 71$ , Ans.

<b>22.</b> $2 \overline{) 1184}$	<b>23.</b> $3 \overline{) 4389}$	<b>24.</b> $2 \overline{) 6300}$	<b>25.</b> $7 \overline{) 40579}$
$\quad 2 \overline{) 592}$	$\quad 7 \overline{) 1463}$	$\quad 2 \overline{) 3150}$	$\quad 11 \overline{) 5797}$
$\quad 2 \overline{) 296}$	$\quad 11 \overline{) 209}$	$\quad 3 \overline{) 1575}$	$\quad 17 \overline{) 527}$
$\quad 2 \overline{) 148}$	$\quad \quad 19$	$\quad 3 \overline{) 525}$	$\quad \quad 31$
$\quad 2 \overline{) 74}$		$\quad 5 \overline{) 175}$	
$\quad \quad 37$	$3, 7, 11, 19, \text{Ans.}$	$\quad 5 \overline{) 35}$	$7, 11, 17, 31, \text{Ans.}$
		$\quad \quad 7$	

37, Ans.

 $2^2, 3^2, 5^2, 7, \text{Ans.}$ **Article 85.**

<b>32.</b>	<b>33.</b>
$\frac{5 \times 5 \times 7}{49 \times 4 \times 9} = \frac{25}{7} = 3\frac{4}{7}, \text{Ans.}$	$\frac{3 \times 3 \times 4 \times 15}{18 \times 12 \times 10} = \frac{9}{2} = 4\frac{1}{2}, \text{Ans.}$

**Article 86.**

<b>34.</b>	<b>35.</b>
$\frac{3 \times 51 \times 9 \times 4}{340 \times 12 \times 7} = \frac{9}{4} = 2\frac{1}{4}, \text{Ans.}$	$\frac{3 \times 8 \times 5}{18 \times 16 \times 10 \times 5} = \frac{25}{2} = 12\frac{1}{2}, \text{Ans.}$

<b>36.</b>	<b>37.</b>
$\frac{5 \times 4 \times 7}{54 \times 10 \times 4 \times 3} = \frac{35}{9} = 3\frac{8}{9}, \text{Ans.}$	$\frac{109 \times 35}{35 \times 35 \times 5} = 109, \text{Ans.}$

<b>38.</b> $\frac{8 \times 3}{64 \times 63} = 24, \text{Ans.}$	<b>39.</b> $\frac{4 \times 3 \times 7}{27 \times 7 \times 6} = \frac{28}{3} = 9\frac{1}{3}, \text{Ans.}$
--	--

<b>40.</b> $\frac{7}{4 \times 42} = 7, \text{Ans.}$	<b>41.</b> $\frac{5}{120} = 5$ $\frac{19}{95} = 19, \text{Ans.}$
---	--

$$42. \frac{\overset{2}{100} \times \overset{4}{12}}{\underset{\beta}{150}} = 8, \text{ Ans.}$$

$$43. \frac{\overset{4}{225} \times \overset{4}{12}}{\underset{\beta}{675}} = 4, \text{ Ans.}$$

$$44. \frac{\overset{5}{15} \times \overset{6}{30} \times \overset{6}{10}}{\underset{\beta}{\beta \times \beta \times \beta}} = \$0.30, \text{ Ans.}$$

**Article 90.**

$$50. 36 = 2 \times 2 \times 3 \times 3$$

$$81 = 3 \times 3 \times 3 \times 3$$

$$135 = 3 \times 3 \times 3 \times 5$$

$$3 \times 3 = 9, \text{ Ans.}$$

$$51. 24 = 2 \times 2 \times 2 \times 3$$

$$42 = 2 \times 3 \times 7$$

$$54 = 2 \times 3 \times 3 \times 3$$

$$60 = 2 \times 2 \times 3 \times 5$$

$$2 \times 3 = 6, \text{ Ans.}$$

**Article 91.**

$$52. 45 = 3 \times 3 \times 5$$

$$135 = 3 \times 3 \times 3 \times 5$$

$$3 \times 3 \times 5 = 45, \text{ Ans.}$$

$$53. 90 = 2 \times 3 \times 3 \times 5$$

$$105 = 3 \times 5 \times 7$$

$$3 \times 5 = 15, \text{ Ans.}$$

$$54. 42 = 2 \times 3 \times 7$$

$$81 = 3 \times 3 \times 3 \times 3$$

$$3, \text{ Ans.}$$

$$55. 132 = 2 \times 2 \times 3 \times 11$$

$$156 = 2 \times 2 \times 3 \times 13$$

$$2 \times 2 \times 3 = 12, \text{ Ans.}$$

$$56. 20 = 2 \times 2 \times 5$$

$$26 = 2 \times 13$$

$$38 = 2 \times 19$$

$$2, \text{ Ans.}$$

$$57. 32 = 2 \times 2 \times 2 \times 2 \times 2$$

$$48 = 2 \times 2 \times 2 \times 2 \times 3$$

$$128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

$$2 \times 2 \times 2 \times 2 = 16, \text{ Ans.}$$

$$58. 45 = 3 \times 3 \times 5$$

$$72 = 2 \times 2 \times 2 \times 3 \times 3$$

$$81 = 3 \times 3 \times 3 \times 3$$

$$3 \times 3 = 9, \text{ Ans.}$$

$$59. 24 = 2 \times 2 \times 2 \times 3$$

$$51 = 3 \times 17$$

$$105 = 3 \times 5 \times 7$$

$$729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3$$

$$3, \text{ Ans.}$$

$$60. 12 = 2 \times 2 \times 3$$

$$15 = 3 \times 5$$

$$18 = 2 \times 3 \times 3$$

3 ft., Ans.

### Article 92.

62.

$$336 ) 480 ( 1$$

$$\underline{336}$$

$$144 ) 336 ( 2$$

$$\underline{288}$$

$$\text{Greatest com. div.} = 48 ) 144 ( 3$$

$$\underline{144}$$

63.

$$925 ) 1475 ( 1$$

$$\underline{925}$$

$$550 ) 925 ( 1$$

$$\underline{550}$$

$$375 ) 550 ( 1$$

$$\underline{375}$$

$$175 ) 375 ( 2$$

$$\underline{350}$$

$$\text{Greatest common divisor} = 25 ) 175 ( 7$$

$$\underline{175}$$

64.

$$308 ) 506 ( 1$$

$$\underline{308}$$

$$198 ) 308 ( 1$$

$$\underline{198}$$

$$110 ) 198 ( 1$$

$$\underline{110}$$

$$88 ) 110 ( 1$$

$$\underline{88}$$

$$\text{Greatest com. div.} = 22 ) 88 ( 4$$

$$\underline{88}$$

65.

$$172 ) 1118 ( 6$$

$$\underline{1032}$$

$$\text{Greatest com. div.} = 86 ) 172 ( 2$$

$$\underline{172}$$

66.

$$275 ) 440 ( 1$$

$$\underline{275}$$

$$165 ) 275 ( 1$$

$$\underline{165}$$

$$110 ) 165 ( 1$$

$$\underline{110}$$

$$\text{Greatest com. div.} = 55 ) 110 ( 2$$

$$\underline{110}$$

67.

$$2145 \overline{) 3471} (1$$

$$\underline{2145}$$

$$\underline{1326} \overline{) 2145} (1$$

$$\underline{1326}$$

$$\underline{819} \overline{) 1326} (1$$

$$\underline{819}$$

$$\underline{507} \overline{) 819} (1$$

$$\underline{507}$$

$$\underline{312}$$

$$\text{Greatest common divisor} = \underline{39} \overline{) 78} (2$$

$$\underline{78}$$

$$312 \overline{) 507} (1$$

$$\underline{312}$$

$$\underline{195} \overline{) 312} (1$$

$$\underline{195}$$

$$\underline{117} \overline{) 195} (1$$

$$\underline{117}$$

$$\underline{78} \overline{) 117} (1$$

$$\underline{78}$$

68.

$$10353 \overline{) 14877} (1$$

$$\underline{10353}$$

$$\underline{4524} \overline{) 10353} (2$$

$$\underline{9048}$$

$$\underline{1305} \overline{) 4524} (3$$

$$\underline{3915}$$

$$\underline{609} \overline{) 1305} (2$$

$$\underline{1218}$$

$$\text{Gr. com. div.} = \underline{87} \overline{) 609} (7$$

$$\underline{609}$$

$$\underline{118} \overline{) 232} (1$$

$$\underline{118}$$

$$\underline{114} \overline{) 118} (1$$

$$\underline{114}$$

$$\underline{4} \overline{) 114} (28$$

$$\underline{112}$$

$$\text{Greatest common divisor} = \underline{2} \overline{) 4} (2$$

$$\underline{4}$$

69.

70.

$$3528 \overline{) 4424} (1$$

$$\underline{3528}$$

$$\underline{896} \overline{) 3528} (3$$

$$\underline{2688}$$

$$\underline{840} \overline{) 896} (1$$

$$\underline{840}$$

$$\text{Greatest com. div.} = \underline{56} \overline{) 840} (15$$

$$\underline{840}$$

71.

$$1764 \overline{) 2660} (1$$

$$\underline{1764}$$

$$\underline{896} \overline{) 1764} (1$$

$$\underline{896}$$

$$\underline{868} \overline{) 896} (1$$

$$\underline{868}$$

$$\text{Gr. com. div.} = \underline{28} \overline{) 868} (31$$

$$\underline{868}$$

**72.**

$$744 \overline{) 906} (1$$

$$\underline{744}$$

$$\overline{162} \overline{) 744} (4$$

$$\underline{648}$$

$$\overline{96} \overline{) 162} (1$$

$$\underline{96}$$

$$\overline{66} \overline{) 96} (1$$

$$\underline{66}$$

$$\overline{30} \overline{) 66} (2$$

$$\underline{60}$$

$$\text{Greatest common divisor} = \overline{6} \overline{) 30} (5$$

$$\underline{30}$$

**73.**

$$728 \overline{) 808} (1$$

$$\underline{728}$$

$$\overline{80} \overline{) 728} (9$$

$$\underline{720}$$

$$\text{Greatest com. div.} = \overline{8} \overline{) 80} (10$$

$$\underline{80}$$

**74.**

$$756 \overline{) 1140} (1$$

$$\underline{756}$$

$$\overline{384} \overline{) 756} (1$$

$$\underline{384}$$

$$\overline{372} \overline{) 384} (1$$

$$\underline{372}$$

$$\text{Gr. com. div.} = \overline{12} \overline{) 372} (31$$

$$\underline{372}$$

**75.**

$$2883 \overline{) 3131} (1$$

$$\underline{2883}$$

$$\overline{248} \overline{) 2883} (11$$

$$\underline{2728}$$

$$\overline{155} \overline{) 248} (1$$

$$\underline{155}$$

$$\overline{93} \overline{) 155} (1$$

$$\underline{93}$$

$$\overline{62} \overline{) 93} (1$$

$$\underline{62}$$

$$\text{Greatest common divisor} = \overline{31} \overline{) 62} (2$$

$$\underline{62}$$

**76.**

$$3178 \overline{) 3500} (1$$

$$\underline{3178}$$

$$\overline{322} \overline{) 3178} (9$$

$$\underline{2898}$$

$$\overline{280} \overline{) 322} (1$$

$$\underline{280}$$

$$\overline{42} \overline{) 280} (6$$

$$\underline{252}$$

$$\overline{28} \overline{) 42} (1$$

$$\underline{28}$$

$$\text{Greatest common divisor} = \overline{14} \overline{) 28} (2$$

$$\underline{28}$$

**77.**

$$4872 \overline{) 9048} (1$$

$$\underline{4872}$$

$$\overline{4176} \overline{) 4872} (1$$

$$\underline{4176}$$

$$\text{Gr. com. div.} = \overline{696} \overline{) 4176} (6$$

$$\underline{4176}$$



**Article 96.**

83.  $7 = 1 \times 7$

$14 = 2 \times 7$

$15 = 3 \times 5$

$21 = 3 \times 7$

84.  $18 = 2 \times 3 \times 3$

$28 = 2 \times 2 \times 7$

$30 = 2 \times 3 \times 5$

$42 = 2 \times 3 \times 7$

$2 \times 3 \times 5 \times 7 = 210, \text{ Ans.} \quad 2 \times 2 \times 3 \times 3 \times 5 \times 7 = 1260, \text{ Ans.}$

**Article 97.**

85.  $21 = 3 \times 7$

$33 = 3 \times 11$

$56 = 2 \times 2 \times 2 \times 7$

86.  $63 = 3 \times 3 \times 7$

$72 = 2 \times 2 \times 2 \times 3 \times 3$

$84 = 2 \times 2 \times 3 \times 7$

$2 \times 2 \times 2 \times 3 \times 7 \times 11 = 1848, \text{ Ans.} \quad 2 \times 2 \times 2 \times 3 \times 3 \times 7 = 504, \text{ Ans.}$

87.  $66 = 2 \times 3 \times 11$

$88 = 2 \times 2 \times 2 \times 11$

$110 = 2 \times 5 \times 11$

88.  $81 = 3 \times 3 \times 3 \times 3$

$63 = 3 \times 3 \times 7$

$135 = 3 \times 3 \times 3 \times 5$

$2 \times 2 \times 2 \times 3 \times 5 \times 11 = 1320, \text{ Ans.} \quad 3 \times 3 \times 3 \times 3 \times 5 \times 7 = 2835, \text{ Ans.}$

89.  $8 = 2 \times 2 \times 2$

$18 = 2 \times 3 \times 3$

$24 = 2 \times 2 \times 2 \times 3$

$36 = 2 \times 2 \times 3 \times 3$

90.  $7 = 1 \times 7$

$25 = 5 \times 5$

$12 = 2 \times 2 \times 3$

$41 = 1 \times 41$

$2 \times 2 \times 2 \times 3 \times 3 = 72, \text{ Ans.} \quad 2 \times 2 \times 3 \times 5 \times 5 \times 7 \times 41 = 86100, \text{ Ans.}$

91.  $28 = 2 \times 2 \times 7$

$56 = 2 \times 2 \times 2 \times 7$

$100 = 2 \times 2 \times 5 \times 5$

$125 = 5 \times 5 \times 5$

92.  $24 = 2 \times 2 \times 2 \times 3$

$42 = 2 \times 3 \times 7$

$54 = 2 \times 3 \times 3 \times 3$

$180 = 2 \times 2 \times 3 \times 3 \times 5$

$2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 7 = 7000, \text{ Ans.} \quad 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7 = 7560, \text{ Ans.}$



<b>101.</b> $48 = 2 \times 2 \times 2 \times 2 \times 3$	<b>102.</b>
$36 = 2 \times 2 \times 3 \times 3$	100
$72 = 2 \times 2 \times 2 \times 3 \times 3$	102
$24 = 2 \times 2 \times 2 \times 3$	104
	105
$2 \times 2 \times 3 = 12$ , Greatest common divisor.	106
$2 \times 2 \times 2 \times 2 \times 3 \times 3 = 144$ , Least common multiple.	108
	110
$12 \overline{) 144} ( 12$ , Ans.	111
<u>144</u>	112
	114
<b>103.</b> $160 = 2 \times 2 \times 2 \times 2 \times 2 \times 5$	115
$352 = 2 \times 2 \times 2 \times 2 \times 2 \times 11$	116
$992 = 2 \times 2 \times 2 \times 2 \times 2 \times 31$	117
	118
$2 \times 2 \times 2 \times 2 \times 2 = 32$ , Greatest common divisor.	119
$2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 11 \times 31 = 54560$ ,	120
Least common multiple.	<u>1777</u> , Ans.
54560	
32	
<u>54528</u> , Ans.	
<b>104.</b> $168 = 2 \times 2 \times 2 \times 3 \times 7$	<b>105.</b>
$1008 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7$	
$\frac{2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7}{2 \times 2 \times 2 \times 2 \times 3 \times 7} = 6$ , Ans.	$\frac{2^3 \times 35}{8} = 105$ , Ans.

**Article 111.**

34.  $\frac{30}{75}$ .

**Article 112.**

<b>35.</b> $\frac{31}{41}$ .	<b>37.</b> $\frac{31}{41}$ .	<b>39.</b> $\frac{120}{180}$ .	<b>41.</b> $\frac{36}{48}$ .
<b>36.</b> $\frac{31}{41}$ .	<b>38.</b> $\frac{152}{188}$ .	<b>40.</b> $\frac{171}{180}$ .	<b>42.</b> $\frac{360}{480}$ .

**Article 114.**53.  $\frac{2}{3}$ .54.  $\frac{4}{5}$ .**Article 115.**55.  $\frac{9}{10}$ .60.  $\frac{3}{4}$ .65.  $\frac{2}{3}$ .70.  $\frac{1}{2}$ .56.  $\frac{7}{8}$ .61.  $\frac{2}{3}$ .66.  $\frac{3}{4}$ .80.  $\frac{1}{2}$ .57.  $\frac{3}{4}$ .62.  $\frac{1}{2}$ .67.  $\frac{1}{2}$ .82.  $\frac{2}{3}$ .58.  $\frac{1}{2}$ .63.  $\frac{1}{2}$ .68.  $\frac{1}{2}$ .83.  $\frac{1}{2}$ .59.  $\frac{3}{4}$ .64.  $\frac{1}{2}$ .69.  $\frac{2}{3}$ .**Article 116.**84.  $\frac{1}{2}$ ;  $\frac{2}{3}$ .88.  $\frac{1}{2}$ .92.  $\frac{1}{2}$ .96.  $\frac{1}{2}$ .85.  $\frac{1}{2}$ .89.  $\frac{1}{2}$ .93.  $\frac{1}{2}$ .97.  $\frac{1}{2}$ .86.  $\frac{1}{2}$ .90.  $\frac{1}{2}$ .94.  $\frac{1}{2}$ .

105. 43.

87.  $\frac{1}{2}$ .91.  $\frac{1}{2}$ .95.  $\frac{1}{2}$ .

106. 63.

**Article 117.**

107. 9.

111.  $\frac{1}{2}$ .115.  $\frac{1}{2}$ .119.  $\frac{1}{2}$ .

108. 25.

112.  $\frac{1}{2}$ .116.  $\frac{1}{2}$ .120.  $\frac{1}{2}$ .109.  $\frac{1}{2}$ .113.  $\frac{1}{2}$ .117.  $\frac{1}{2}$ .121.  $\frac{1}{2}$ .

110. 1.

114. 128.

118.  $\frac{1}{2}$ .**Article 120.**131.  $\frac{1}{2}$ ,  $\frac{1}{3}$ .133.  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ .134.  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ .

**Article 121.**

135.  $\frac{10}{48}, \frac{21}{48}$ .

142.  $\frac{18}{8}, \frac{4}{8}, \frac{28}{8}$ .

136.  $\frac{32}{91}, \frac{28}{91}$ .

143.  $\frac{297}{2475}, \frac{235}{2475}, \frac{675}{2475}, \frac{66}{2475}$ .

137.  $\frac{63}{108}, \frac{124}{108}$ .

144.  $\frac{700}{1000}, \frac{70}{1000}, \frac{7000}{1000}, \frac{7000}{1000}$ .

138.  $\frac{125}{1200}, \frac{144}{1200}$ .

145.  $\frac{186}{24}, \frac{2}{24}, \frac{20}{24}, \frac{14}{24}$ .

139.  $\frac{18}{84}, \frac{32}{84}, \frac{27}{84}$ .

146.  $\frac{25}{40}, \frac{36}{40}, \frac{30}{40}$ .

140.  $\frac{105}{128}, \frac{70}{128}, \frac{72}{128}$ .

147.  $\frac{20}{48}, \frac{27}{48}, \frac{24}{48}$ .

141.  $\frac{40}{105}, \frac{50}{105}, \frac{51}{105}$ .

**Article 123.**

156.  $\frac{5}{8} + \frac{11}{12} + \frac{13}{16} = \frac{30}{48} + \frac{44}{48} + \frac{39}{48} = \frac{113}{48} = 2\frac{17}{48}, \text{ Ans.}$

157.

$$\frac{5}{14} + \frac{11}{18} + \frac{9}{20} = \frac{450}{1260} + \frac{770}{1260} + \frac{567}{1260} = \frac{1787}{1260} = 1\frac{527}{1260}, \text{ Ans.}$$

**Article 124.**

158.  $\frac{4}{9} + \frac{5}{14} + \frac{5}{42} = \frac{56}{126} + \frac{45}{126} + \frac{15}{126} = \frac{116}{126} = \frac{58}{63}, \text{ Ans.}$

159.  $\frac{15}{21} + \frac{11}{21} + \frac{17}{21} = \frac{43}{21} = 2\frac{1}{21}, \text{ Ans.}$

160.  $\frac{23}{24} + \frac{61}{96} = \frac{92}{96} + \frac{61}{96} = \frac{153}{96} = 1\frac{3}{32}, \text{ Ans.}$

161.

$$\frac{9}{7} + \frac{6}{11} + \frac{8}{14} = \frac{198}{154} + \frac{84}{154} + \frac{88}{154} = \frac{370}{154} = 2\frac{62}{77} = 2\frac{31}{37}, \text{ Ans.}$$

$$162. \frac{5}{17} + \frac{7}{51} + \frac{9}{68} = \frac{60}{204} + \frac{28}{204} + \frac{27}{204} = \frac{115}{204}, \text{ Ans.}$$

$$163. \frac{31}{6} + \frac{7}{9} + \frac{61}{24} = \frac{372}{72} + \frac{56}{72} + \frac{183}{72} = \frac{611}{72} = 8\frac{7}{8}, \text{ Ans.}$$

$$164. \frac{7}{8} + \frac{3}{10} + \frac{11}{10} + \frac{7}{18} = \frac{315}{360} + \frac{108}{360} + \frac{396}{360} + \frac{140}{360} = \frac{959}{360} = 2\frac{338}{360}, \text{ Ans.}$$

$$165. \frac{3}{25} + \frac{49}{50} + \frac{74}{75} + \frac{81}{100} = \frac{36}{300} + \frac{294}{300} + \frac{296}{300} + \frac{243}{300} = \frac{869}{300} = 2\frac{389}{300}, \text{ Ans.}$$

$$166. \frac{2}{5} + \frac{23}{36} + \frac{17}{9} + \frac{7}{1} = \frac{72}{180} + \frac{115}{180} + \frac{340}{180} + \frac{1260}{180} = \frac{1787}{180} = 9\frac{107}{180}, \text{ Ans.}$$

## Article 125.

167.

$$\begin{array}{r} 15\frac{3}{4} \\ 24\frac{5}{8} \\ \hline 39 \\ 1\frac{3}{8} \\ \hline 40\frac{3}{8}, \text{ Ans.} \end{array} \quad \begin{array}{l} \frac{3}{4} + \frac{5}{8} = \\ \frac{6}{8} + \frac{5}{8} = \\ \frac{11}{8} = 1\frac{3}{8} \end{array}$$

$$\begin{array}{r} 37\frac{3}{8} \\ 109\frac{3}{8} \\ 341\frac{3}{8} \\ \hline 487 \\ 1\frac{1}{2} \\ \hline 488\frac{1}{2}, \text{ Ans.} \end{array}$$

168.

$$\begin{array}{l} \frac{5}{6} + \frac{2}{7} + \frac{8}{21} = \\ \frac{35}{42} + \frac{12}{42} + \frac{16}{42} = \\ \frac{63}{42} = 1\frac{1}{2} = 1\frac{1}{2} \end{array}$$

169.

$$\begin{array}{r} \$4\frac{3}{4} \\ 16\frac{1}{2} \\ 5\frac{7}{8} \\ \hline \$25 \\ 2\frac{1}{8} \\ \hline \$27\frac{1}{8}, \text{ Ans.} \end{array} \quad \begin{array}{l} \frac{3}{4} + \frac{1}{2} + \frac{7}{8} = \\ \frac{6}{8} + \frac{4}{8} + \frac{7}{8} = \\ \frac{17}{8} = 2\frac{1}{8} \end{array}$$

$$\begin{array}{r} 160\frac{3}{4} \\ 67\frac{1}{8} \\ 85\frac{7}{8} \\ \hline 312 \\ 1\frac{3}{8} \\ \hline 313\frac{3}{8}, \text{ Ans.} \end{array}$$

170.

$$\begin{array}{l} \frac{3}{4} + \frac{5}{16} + \frac{7}{20} = \\ \frac{60}{80} + \frac{25}{80} + \frac{28}{80} = \\ \frac{113}{80} = 1\frac{33}{80} \end{array}$$

**Article 126.**

$$182. \frac{21}{24} - \frac{31}{42} = \frac{147}{168} - \frac{124}{168} = \frac{23}{168}, \text{ Ans.}$$

$$183. \frac{29}{30} - \frac{23}{30} = \frac{6}{30} = \frac{1}{5}, \text{ Ans.}$$

$$184. \frac{17}{42} - \frac{3}{14} = \frac{17}{42} - \frac{9}{42} = \frac{8}{42} = \frac{4}{21}, \text{ Ans.}$$

**Article 127.**

$$185. \frac{17}{24} - \frac{7}{20} = \frac{85}{120} - \frac{42}{120} = \frac{43}{120}, \text{ Ans.}$$

$$186. \frac{11}{34} - \frac{1}{10} = \frac{110}{340} - \frac{34}{340} = \frac{76}{340} = \frac{19}{85}, \text{ Ans.}$$

$$187. \frac{31}{36} - \frac{9}{16} = \frac{124}{144} - \frac{81}{144} = \frac{43}{144}, \text{ Ans.}$$

$$188. \frac{167}{711} - \frac{19}{711} = \frac{148}{711}, \text{ Ans.}$$

$$189. \frac{48}{68} = \frac{12}{17}; \quad \frac{37}{51} - \frac{12}{17} = \frac{37}{51} - \frac{36}{51} = \frac{1}{51}, \text{ Ans.}$$

$$190. \frac{97}{100} - \frac{17}{100} = \frac{80}{100} = \frac{4}{5}, \text{ Ans.}$$

$$191. \frac{1}{10} - \frac{19}{1000} = \frac{100}{1000} - \frac{19}{1000} = \frac{81}{1000}, \text{ Ans.}$$

$$192. \frac{41}{34} - \frac{17}{17} = \frac{41}{34} - \frac{34}{34} = \frac{7}{34}, \text{ Ans.}$$

$$193. \frac{43}{216} - \frac{19}{96} = \frac{172}{864} - \frac{171}{864} = \frac{1}{864}, \text{ Ans.}$$

$$194. \frac{15}{30} - \frac{15}{31} = \frac{465}{930} - \frac{450}{930} = \frac{15}{930} = \frac{1}{62}, \text{ Ans.}$$

$$196. \quad 31\frac{3}{4} = 31\frac{37}{48} \\ 10\frac{1}{8} = 10\frac{6}{8} \\ \underline{21\frac{33}{8}}, \text{ Ans.}$$

$$197. \quad 63 = 62\frac{1}{2} \\ 54\frac{7}{8} = 54\frac{7}{8} \\ \underline{8\frac{5}{8}}, \text{ Ans.}$$

$$198. \quad 73\frac{9}{10} = 73\frac{18}{20} \\ 67\frac{5}{10} = 67\frac{10}{20} \\ \underline{6\frac{17}{20}}, \text{ Ans.}$$

$$199. \quad 29\frac{1}{8} = 29\frac{17}{16} \\ 16\frac{5}{8} = 16\frac{10}{16} \\ \underline{13\frac{27}{16}}, \text{ Ans.}$$

$$200. \quad 311 = 310\frac{1}{2} \\ 30\frac{1}{2} = 30\frac{1}{2} \\ \underline{280\frac{1}{2}}, \text{ Ans.}$$

$$201. \quad 103\frac{1}{8} = 103\frac{12}{24} \\ 99\frac{7}{8} = 99\frac{21}{24} \\ \underline{4\frac{17}{24}} = 4\frac{12}{24}, \text{ Ans.}$$

$$202. \quad \$7\frac{1}{2} = \$7\frac{1}{2} = \$6\frac{3}{4} \\ \$1\frac{1}{2} = 1\frac{3}{4} \\ \underline{\$5\frac{1}{4}}, \text{ Ans.}$$

$$203. \quad 150 = 149\frac{1}{2} \\ 147\frac{1}{2} = 147\frac{1}{2} \\ \underline{2\frac{1}{2}}, \text{ Ans.}$$

$$204. \quad 19\frac{1}{2} = 19\frac{1}{2} \\ 17\frac{3}{4} = 17\frac{3}{4} \\ \underline{2\frac{1}{4}}, \text{ Ans.}$$

**Article 128.**

$$\begin{array}{llll} 212. 1\frac{1}{2}. & 214. 37\frac{1}{2}. & 216. 10\frac{1}{2}. & 218. 43\frac{1}{2}. \\ 213. 15\frac{1}{2}. & 215. 49. & 217. 2\frac{3}{10}. & 219. 144. \end{array}$$

$$221. \quad \frac{7}{18} \times \frac{3}{27} = \frac{21}{2} = 10\frac{1}{2} \\ 2 \\ 40 \times 27 = \frac{1080}{1090\frac{1}{2}}, \text{ Ans.}$$

$$222. \quad \frac{4}{9} \times \frac{7}{63} = 28 \\ 81 \times 63 = \frac{5103}{5131}, \text{ Ans.}$$



$$223. \frac{3}{\cancel{10}^7} \times \frac{5}{\cancel{7}^5} = \frac{15}{7} = 2\frac{1}{7}$$

$$39 \times 75 = \frac{2925}{2927\frac{1}{2}}, \text{ Ans.}$$

$$224. \frac{5}{\cancel{10}^7} \times \frac{5}{\cancel{80}^5} = 25$$

$$125 \times 80 = \frac{10000}{10025}, \text{ Ans.}$$

$$225. \frac{5}{\cancel{8}^9} \times \frac{9}{\cancel{72}^8} = \$45$$

$$8 \times 72 = \frac{576}{\$621}, \text{ Ans.}$$

**Article 129.**

$$232. 84. \quad 234. 325. \quad 236. 88. \quad 238. 17\frac{1}{11}.$$

$$233. 24\frac{1}{8}. \quad 235. 97\frac{1}{4}. \quad 237. 165\frac{1}{3}. \quad 239. 243\frac{1}{7}.$$

**241.**

$$\frac{55}{\cancel{110}^2} \times \frac{3}{\cancel{4}^2} = \frac{165}{2} = 82\frac{1}{2}$$

$$110 \times 9 = \frac{990}{1072\frac{1}{2}}, \text{ Ans.}$$

**242.**

$$85 \times \frac{1}{6} = \frac{85}{6} = 14\frac{1}{6}$$

$$85 \times 13 = \frac{1105}{1119\frac{1}{8}}, \text{ Ans.}$$

**243.**

$$\frac{7}{\cancel{84}^7} \times \frac{5}{\cancel{12}^4} = 35$$

$$84 \times 9 = \frac{756}{791}, \text{ Ans.}$$

**244.**

$$145 \times \frac{6}{7} = \frac{870}{7} = 124\frac{2}{7}$$

$$145 \times 11 = \frac{1595}{1719\frac{1}{3}}, \text{ Ans.}$$

$$245. \frac{25}{\cancel{50}^4} \times \frac{5}{\cancel{8}^4} = \frac{125}{4} = 31\frac{1}{4}$$

$$50 \times 25 = \frac{1250}{1281\frac{1}{4}}, \text{ Ans.}$$

**Article 130.**

$$256. \frac{18}{19} \times \frac{11}{\frac{12}{2}} = \frac{33}{38}, \text{ Ans.} \quad \frac{\frac{8}{15}}{\frac{36}{8}} \times \frac{2}{\frac{24}{5}} = \frac{2}{5}, \text{ Ans.}$$

**Article 131.**

$$257. \frac{35}{\frac{72}{8}} \times \frac{3}{27} = \frac{105}{8} = 13\frac{1}{8}, \text{ Ans.} \quad 258. \frac{\frac{4}{36}}{\frac{65}{5}} \times \frac{\frac{4}{52}}{\frac{99}{11}} = \frac{16}{55}, \text{ Ans.}$$

**259.**

$$\frac{\frac{89}{267}}{\frac{300}{100}} \times \frac{7}{5} = \frac{623}{500} = 1\frac{123}{500}, \text{ Ans.}$$

**260.**

$$\frac{7}{9} \times \frac{2}{\frac{6}{11}} = \frac{28}{99}, \text{ Ans.}$$

**261.**

$$\frac{\frac{12}{48}}{5} \times \frac{\frac{4}{5}}{\frac{5}{16}} = \frac{12}{5} = 2\frac{2}{5}, \text{ Ans.}$$

**262.**

$$\frac{\frac{35}{17}}{\frac{1}{7}} \times \frac{\frac{3}{51}}{\frac{7}{2}} = \frac{3}{14}, \text{ Ans.}$$

**263.**

$$\frac{\frac{8}{4}}{\frac{2}{9}} \times \frac{\frac{10}{8}}{\frac{2}{5}} = \frac{20}{9} = 2\frac{2}{9}, \text{ Ans.}$$

**264.**

$$\frac{3}{4} \times \frac{4}{5} \times \frac{5}{6} \times \frac{6}{7} = \frac{3}{7}, \text{ Ans.}$$

$$265. 7\frac{1}{8} = \frac{47}{8}, 11\frac{3}{8} = \frac{91}{8}; \frac{91}{8} \times \frac{47}{6} = \frac{4277}{48} = 89\frac{1}{48}, \text{ Ans.}$$

$$266. \frac{11}{5} \text{ of } \frac{7}{2} \times \frac{8}{5} \times \frac{2}{3} \text{ of } \frac{\frac{2}{10}}{1} = \frac{1232}{15} = 82\frac{2}{15}, \text{ Ans.}$$

$$267. \frac{8}{9} \text{ of } \frac{4}{7} \text{ of } \frac{9}{11} \times \frac{2}{5} \text{ of } \frac{18}{1} = \frac{144}{77} = 1\frac{67}{77}, \text{ Ans.}$$

268.

$$8\frac{3}{10} = \frac{83}{10}, 9\frac{1}{4} = \frac{37}{4}; \frac{4}{7} \text{ of } \frac{83}{10} \times \frac{4}{7} \text{ of } \frac{37}{4} = \frac{6142}{245} = 25\frac{17}{49}, \text{ Ans.}$$

269.

$$5\frac{7}{10} = \frac{57}{10}, 21\frac{3}{8} = \frac{345}{16}; \frac{69}{16} \times \frac{57}{10} = \frac{3933}{32} = \$122\frac{33}{32}, \text{ Ans.}$$

270.

$$4\frac{9}{10} = \frac{49}{10}, 3\frac{7}{12} = \frac{43}{12}; \frac{3}{4} \text{ of } \frac{43}{12} \times \frac{49}{10} = \frac{2107}{160} = 13\frac{27}{160}, \text{ Ans.}$$

## Article 132.

282. $\frac{7}{28}$ .	289. $\frac{8}{33}$ .	305. $29\frac{1}{11}$ .	311. 162.
283. $\frac{4}{13}$ .	291. $\frac{3}{40}$ .	306. $87\frac{1}{2}$ .	312. $111\frac{1}{2}$ .
284. $\frac{3}{17}$ .	292. $15\frac{7}{8}$ .	307. $52\frac{1}{2}$ .	313. $21\frac{1}{2}$ .
285. $\frac{7}{18}$ .	293. $3\frac{1}{2}$ .	308. 170.	314. 64.
286. $\frac{4}{180}$ .	294. $\$6\frac{3}{4}$ .	309. $151\frac{1}{11}$ .	315. 16.
287. $\frac{4}{9}$ .	304. $88\frac{1}{2}$ .	310. 40.	316. 7.
288. $\frac{1}{15}$ .			

$$327. \frac{7}{9} \div \frac{4}{7} = \frac{7}{9} \times \frac{7}{4} = \frac{49}{36} = 1\frac{13}{36}, \text{ Ans.}$$

$$328. \frac{12}{25} \div \frac{9}{10} = \frac{12}{25} \times \frac{10}{9} = \frac{8}{15}, \text{ Ans.}$$

## Article 133.

329.

$$\frac{25}{39} \div \frac{10}{13} = \frac{\overset{5}{\cancel{25}}}{\underset{3}{\cancel{39}}} \times \frac{\overset{13}{\cancel{13}}}{\underset{2}{\cancel{10}}} = \frac{5}{6}, \text{ Ans.}$$

330.

$$\frac{12}{49} \div \frac{3}{7} = \frac{\overset{4}{\cancel{12}}}{\underset{7}{\cancel{49}}} \times \frac{\overset{7}{\cancel{7}}}{\underset{3}{\cancel{3}}} = \frac{4}{7}, \text{ Ans.}$$

$$331. \frac{11}{12} \div \frac{47}{56} = \frac{11}{\underset{3}{\cancel{12}}} \times \frac{\overset{14}{\cancel{56}}}{47} = \frac{154}{141} = 1\frac{13}{41}, \text{ Ans.}$$

$$332. \frac{17}{20} \div \frac{3}{5} = \frac{17}{\underset{4}{\cancel{20}}} \times \frac{\overset{5}{\cancel{5}}}{3} = \frac{17}{12} = 1\frac{5}{12}, \text{ Ans.}$$

$$333. \frac{38}{275} \div \frac{133}{385} = \frac{\overset{2}{\cancel{38}}}{\underset{5}{\cancel{275}}} \times \frac{\overset{7}{\cancel{385}}}{\underset{7}{\cancel{133}}} = \frac{2}{5}, \text{ Ans.}$$

$$334. \frac{41}{33} \div \frac{63}{11} = \frac{41}{\underset{3}{\cancel{33}}} \times \frac{\overset{11}{\cancel{11}}}{63} = \frac{41}{189}, \text{ Ans.}$$

$$335. 9\frac{3}{8} \div 4\frac{1}{2} = \frac{\overset{25}{\cancel{75}}}{\underset{4}{\cancel{8}}} \times \frac{\overset{2}{\cancel{2}}}{\underset{3}{\cancel{9}}} = \frac{25}{12} = 2\frac{1}{12}, \text{ Ans.}$$

$$336. \frac{208}{135} \div \frac{130}{441} = \frac{\overset{104}{\cancel{208}}}{\underset{15}{\cancel{135}}} \times \frac{\overset{49}{\cancel{441}}}{\underset{65}{\cancel{130}}} = \frac{5096}{975} = 5\frac{376}{975}, \text{ Ans.}$$

$$337. 17\frac{1}{21} \div 5\frac{2}{7} = \frac{\overset{73}{\cancel{365}}}{\underset{7}{\cancel{21}}} \times \frac{\overset{2}{\cancel{6}}}{\underset{7}{\cancel{35}}} = \frac{146}{49} = 2\frac{48}{49}, \text{ Ans.}$$

$$338. 100\frac{1}{2} \div 8\frac{1}{2} = \frac{905}{9} \times \frac{2}{26} = \frac{905}{78} = 11\frac{1}{6}, \text{ Ans.}$$

$$339. \frac{14}{25} \div \frac{14}{16} = \frac{14}{25} \times \frac{16}{14} = \frac{16}{25}, \text{ Ans.}$$

$$340. 11\frac{1}{4} = \frac{45}{4}; \quad \frac{45}{4} \div \frac{5}{8} = \frac{45}{4} \times \frac{8}{5} = 18, \text{ Ans.}$$

341.

$$15\frac{3}{10} = \frac{153}{10}, \quad 3\frac{1}{2} = \frac{18}{5}; \quad \frac{153}{10} \div \frac{18}{5} = \frac{153}{10} \times \frac{5}{18} = \frac{17}{4} = 4\frac{1}{4}, \text{ Ans.}$$

$$343. \frac{9}{13} = \frac{9}{13} \div \frac{2}{5} = \frac{9}{13} \times \frac{5}{2} = \frac{45}{26} = 1\frac{19}{26}, \text{ Ans.}$$

$$344. \frac{12}{8} = \frac{12}{1} \div \frac{5}{8} = \frac{12}{1} \times \frac{8}{5} = \frac{96}{5} = 19\frac{1}{5}, \text{ Ans.}$$

$$345. \frac{67}{8} = \frac{44}{7} \div \frac{3}{8} = \frac{44}{7} \times \frac{8}{3} = \frac{352}{21} = 16\frac{16}{21}, \text{ Ans.}$$

$$346. \frac{51}{11} = \frac{11}{2} \div \frac{11}{1} = \frac{11}{2} \times \frac{1}{11} = \frac{1}{2}, \text{ Ans.}$$

$$347. \frac{19}{211} = \frac{19}{1} \div \frac{26}{11} = \frac{19}{1} \times \frac{11}{26} = \frac{209}{26} = 8\frac{1}{26}, \text{ Ans.}$$

$$348. \frac{63}{88} = \frac{20}{3} \div \frac{53}{6} = \frac{20}{3} \times \frac{6}{53} = \frac{40}{53}, \text{ Ans.}$$

$$349. \frac{104}{831} = \frac{75}{7} \div \frac{333}{4} = \frac{75}{7} \times \frac{4}{333} = \frac{100}{777}, \text{ Ans.}$$

$$350. 23\frac{3}{4} = \frac{95}{4}; \quad \frac{95}{4} \div \frac{19}{36} = \frac{95}{4} \times \frac{36}{19} = 45, \text{ Ans.}$$

351.

$$31\frac{9}{14} = \frac{440}{14}, \quad 125\frac{4}{7} = \frac{880}{7}; \quad \frac{880}{7} \div \frac{440}{14} = \frac{880}{7} \times \frac{14}{440} = 4, \text{ Ans.}$$

**Article 134.**

359. $\frac{3}{8}$ .	363. $\frac{1}{8}$ .	367. $1\frac{1}{2}$ .	371. \$52.50.
360. $\frac{9}{8}$ .	364. $7\frac{5}{8}$ .	368. $1\frac{1}{2}$ .	372. $4\frac{1}{8}$ .
361. $7\frac{5}{8}$ .	365. $\frac{9}{8}$ .	369. $1\frac{6}{7}$ .	373. $\frac{3}{8}$ .
362. $\frac{1}{8}$ .	366. $1\frac{1}{8}$ .	370. 112.	374. \$4 $\frac{27}{100}$ .

$$388. \frac{39}{9} \times 25 = 975, \text{ Ans.}$$

**Article 135.**

$$389. \frac{152}{9} \times 11 = 1672, \text{ Ans.} \quad 390. \frac{81}{11} \times 23 = 1863, \text{ Ans.}$$

$$391. \frac{1600}{125} \times 100 = 6400, \text{ Ans.}$$

$$392. \frac{273}{21} \times 50 = 650; \quad \frac{4}{5} \text{ of } \frac{130}{5} = 520, \text{ Ans.}$$

$$393. \frac{200}{8} \times 15 = 3000; \quad \$3000 - \$1600 = \$1400, \text{ Ans.}$$

$$394. \frac{12}{17} \text{ of } \frac{20}{340} = 240; \frac{30}{8} \times 11 = 330, \text{ Ans.}$$

$$395. \frac{3}{5} \div \frac{9}{10} = \frac{8}{5} \times \frac{10}{9} = \frac{2}{3}, \text{ Ans.}$$

$$396. 7\frac{1}{2} = \frac{15}{2}; \frac{15}{2} \div \frac{5}{17} = \frac{15}{2} \times \frac{17}{5} = \frac{51}{2} = 25\frac{1}{2}, \text{ Ans.}$$

$$397. \frac{7}{7} - \frac{3}{7} = \frac{4}{7}; \frac{231}{\frac{462}{2}} \times 7 = \frac{1617}{2} = \$808\frac{1}{2}, \text{ Ans.}$$

$$398. \frac{1310}{\frac{3930}{3}} \times 5 = \$6550, \text{ Ans.}$$

$$399. 1\frac{5}{16} = \frac{21}{16}; \frac{125}{\frac{2000}{16}} \times 21 = \$2625, \text{ Ans.}$$

$$400. \frac{9}{9} + \frac{2}{9} = \frac{11}{9}; \frac{991}{\frac{10901}{11}} \times 9 = \$8919, \text{ Ans.}$$

## MISCELLANEOUS EXERCISES.

$$401. 43\frac{1}{2} = \frac{87}{2}; \frac{87}{2} \div \frac{5}{6} = \frac{87}{2} \times \frac{6}{5} = \frac{261}{5} = 52\frac{1}{5}, \text{ Ans.}$$

$$402. 2\frac{1}{2} = \frac{5}{2}; \frac{15}{16} \div \frac{5}{2} = \frac{15}{16} \times \frac{2}{5} = \frac{3}{8}, \text{ Ans.}$$

$$403. 12 \times \frac{3}{4} \div \frac{4}{5} = \cancel{12}^3 \times \frac{3}{\cancel{4}} \times \frac{5}{4} = \frac{45}{4} = 11\frac{1}{4}, \text{ Ans.}$$

$$404. \frac{\begin{smallmatrix} .80 \\ \cancel{5.60} \end{smallmatrix}}{\cancel{7}} \times 8 = \$6.40, \text{ Ans.}$$

405.

$$\frac{7}{11} \text{ of } 12\frac{1}{2} = \frac{7}{8} \times \frac{11}{3} \times \frac{25}{2} = \frac{1925}{48}; \quad \frac{1}{7\frac{1}{4}} \text{ of } 8\frac{3}{4} = \frac{1}{3} \times \frac{2}{15} \times \frac{35}{4} = \frac{7}{18}$$

$$\frac{1925}{48} \div \frac{7}{18} = \frac{275}{\cancel{48}^3} \times \frac{18}{\cancel{7}} = \frac{825}{8} = 103\frac{1}{8}, \text{ Ans.}$$

$$406. 20 \div 7\frac{2}{3} = 20 \times \frac{8}{59} = \frac{160}{59} = 2\frac{42}{59}, \text{ Ans.}$$

$$407. 60 \div \frac{9}{11} = \cancel{60}^{20} \times \frac{11}{\cancel{9}_3} = \frac{220}{3} = 73\frac{1}{3}, \text{ Ans.}$$

$$408. 106\frac{2}{3} \div 8 = \frac{961}{9} \times \frac{1}{8} = \frac{961}{72} = \$13\frac{5}{8}, \text{ Ans.}$$

$$409. \$350 - \$125 = \$225; \quad \frac{225}{350} = \frac{9}{14}, \text{ Ans.}$$

$$410. 19 \div 2\frac{4}{7} = 19 \times \frac{7}{17} = \frac{133}{17} = 7\frac{9}{17} \text{ pieces, Ans.}$$

$$\frac{14}{17} \text{ of } 2\frac{4}{7} \text{ ft.} = 2 \text{ ft., Ans.}$$

$$411. \$67\frac{1}{2} \div 10\frac{1}{3} = \frac{\cancel{135}^5}{\cancel{2}} \times \frac{4}{\cancel{81}_3} = \frac{20}{3} = \$6\frac{2}{3}, \text{ Ans.}$$



$$412. \frac{21}{27} = \frac{7}{9}, \quad \frac{14}{18} = \frac{7}{9}; \quad \frac{7}{9} \div \frac{7}{9} = \frac{7}{9} \times \frac{9}{7} = 1, \text{ Ans.}$$

$$413. \frac{14}{3} \text{ of } \frac{36}{7} \times \frac{8}{1} = 192; \quad 28\frac{1}{2} \div 7\frac{1}{8} = \frac{57}{2} \times \frac{8}{57} = 4$$

$$\frac{192}{4} = 48, \text{ Ans.}$$

$$414. 4\frac{1}{2} \div 2\frac{1}{3} = \frac{21}{5} \times \frac{3}{7} = \frac{9}{5} = 1\frac{4}{5}, \text{ Ans.}$$

$$415. \frac{1}{9} \text{ of } 1\frac{1}{4} \times 4\frac{1}{2} = \frac{1}{9} \times \frac{5}{4} \times \frac{9}{2} = \frac{5}{8}$$

$$\frac{5}{56} \text{ of } 1\frac{1}{2} \times 3\frac{1}{2} = \frac{5}{56} \times \frac{4}{3} \times \frac{7}{2} = \frac{5}{12}$$

$$\frac{5}{8} \div \frac{5}{12} = \frac{5}{8} \times \frac{12}{5} = 1\frac{1}{2}, \text{ Ans.}$$

$$416. \$20 \div 6\frac{1}{4} = 20 \times \frac{4}{25} = \frac{16}{5} = \$3\frac{1}{5}, \text{ per acre;}$$

$$\$3\frac{1}{5} \times 9\frac{3}{5} = \frac{16}{5} \times \frac{48}{5} = \$30, \text{ Ans.}$$

417.

$$50 \div 10\frac{1}{2} = \frac{25}{54} \times \frac{5}{27} = \frac{125}{27} = 4\frac{17}{27}; \quad 12\frac{1}{2} - 4\frac{17}{27} = 8\frac{13}{27}, \text{ Ans.}$$

$$418. \$236 \div 11\frac{1}{2} = \frac{4}{236} \times \frac{5}{59} = \$20, \text{ cost of one acre;}$$

$$20\frac{7}{10} \times 20 = \frac{207}{10} \times \frac{2}{1} = \$414, \text{ Ans.}$$

419.

$$\$969 \div 2\frac{3}{4} = \frac{51}{969} \times \frac{8}{19} = \$408; \$969 - \$408 = \$561, \text{ Ans.}$$

**Article 136.**

$$34. \begin{array}{r} 3 \overline{) 2157} \\ 3 \overline{) 3741} \end{array} = \frac{719}{1247}, \text{ Ans.}$$

$$35. \begin{aligned} 1728 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \\ 2880 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \end{aligned}$$

$$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 576, \text{ Ans.}$$

$$36. \begin{aligned} 243 &= 3 \times 3 \times 3 \times 3 \times 3 \\ 972 &= 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \\ 576 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \end{aligned}$$

$$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 = 15552, \text{ Ans.}$$

$$37. \frac{5+6}{6+7} = \frac{11}{13}; \frac{11}{13} - \frac{5}{6} = \frac{66}{78} - \frac{65}{78} = \frac{1}{78}; \frac{11}{13} \text{ is } \frac{1}{78} \text{ greater}$$

$$\text{than } \frac{5}{6}; \frac{6}{7} - \frac{11}{13} = \frac{78}{91} - \frac{77}{91} = \frac{1}{91}; \frac{11}{13} \text{ is } \frac{1}{91} \text{ less than } \frac{6}{7}, \text{ Ans.}$$

$$38. \frac{38}{60} = \frac{190}{300}, \frac{3}{4} = \frac{225}{300}, \frac{17}{100} = \frac{51}{300};$$

$$\frac{190}{300} + \frac{225}{300} + \frac{51}{300} = \frac{466}{300} = 1\frac{233}{150}, \text{ Ans.}$$

$$\begin{array}{r}
 2 \\
 1\frac{1}{2} \\
 3\frac{2}{3} \\
 \frac{13\cancel{7}}{10} \\
 17 \\
 \frac{1\cancel{2}8}{18\frac{2}{3}}, \text{ Ans.}
 \end{array}$$

39.

$$\begin{aligned}
 \frac{3}{4} + \frac{1}{8} + \frac{2}{5} + \frac{7}{10} &= \\
 \frac{30}{40} + \frac{5}{40} + \frac{16}{40} + \frac{28}{40} &= \frac{79}{40} = 1\frac{39}{40}
 \end{aligned}$$

$$40. 16 - \frac{117}{237} = 15\frac{7}{39} - \frac{3}{13} = 15\frac{4}{13}, \text{ Ans.}$$

$$41. 24\frac{1}{2} + 9\frac{7}{8} = 33\frac{3}{8} = 34, \text{ Ans.}$$

$$42. 2\frac{3}{8} \times \frac{7}{8} \text{ of } \frac{9}{10} = \frac{17}{8} \times \frac{7}{8} \times \frac{\overset{3}{9}}{10} = \frac{357}{160} = 2\frac{37}{80}, \text{ Ans.}$$

$$43. \frac{\overset{8}{8}}{7} \text{ of } \frac{5}{\underset{3}{9}} = \frac{5}{21}, \quad \frac{1}{2} \text{ of } \frac{\overset{8}{8}}{\underset{3}{9}} = \frac{1}{3};$$

$$\frac{1}{3} - \frac{5}{21} = \frac{7}{21} - \frac{5}{21} = \frac{2}{21}, \text{ Ans.}$$

$$44. 229\frac{1}{2} \div 8\frac{1}{2} = \frac{\overset{27}{459}}{2} \times \frac{2}{\cancel{17}} = 27, \text{ Ans.}$$

$$45. \frac{31}{97} \div 3\frac{1}{3} = \frac{31}{97} \times \frac{\cancel{97}}{301} = \frac{31}{301}, \text{ Ans.}$$

46.

$$6 = 2 \times 3$$

$$8 = 2 \times 2 \times 2$$

$$9 = 3 \times 3$$

$$2 \times 2 \times 2 \times 3 \times 3 = 72, \text{ Least common multiple.}$$

$$72 + 4 = 76, \text{ Ans.}$$

$$47. \frac{5}{6} + \frac{13}{18} + \frac{5}{8} = \frac{60}{72} + \frac{52}{72} + \frac{45}{72} = \frac{157}{72} = 2\frac{1}{8}, \text{ Ans.}$$

$$48. \frac{4}{7} \times \frac{13}{13} = \frac{52}{91}, \text{ Ans.}$$

$$49. 53 - 27 = 26; 26 \times \frac{1}{5} = \frac{26}{5} = 5\frac{1}{5}; \frac{1}{2} \text{ of } \frac{1}{5} = \frac{1}{10};$$

$$\frac{1}{10} + \frac{1}{5} = \frac{3}{10}, \text{ what each boy has; } 27 \times \frac{3}{10} = \frac{81}{10} = 8\frac{1}{10};$$

$$8\frac{1}{10} + 5\frac{1}{5} = 13\frac{3}{10}, \text{ Ans.}$$

$$50. \frac{1}{12} + \frac{1}{4} + \frac{1}{8} = \frac{2}{24} + \frac{6}{24} + \frac{3}{24} = \frac{11}{24}$$

$$\frac{1}{3} + \frac{1}{6} + \frac{1}{9} = \frac{6}{18} + \frac{3}{18} + \frac{2}{18} = \frac{11}{18}$$

$$\frac{11}{24} \div \frac{11}{18} = \frac{11}{24} \times \frac{18}{11} = \frac{3}{4}, \text{ Ans.}$$

$$51. \frac{2}{8} \text{ of } \frac{12}{7} = \frac{8}{7}, \frac{3\frac{1}{2}}{16} = \frac{7}{2} \times \frac{1}{16} = \frac{7}{32}; \frac{1}{8} \times \frac{7}{32} = \frac{1}{4}, \text{ Ans.}$$

$$52. \frac{7}{12} \text{ of } 2\frac{1}{4} = \frac{7}{12} \times \frac{11}{4} = \frac{77}{48}; \frac{4\frac{1}{2}}{3} = \frac{77}{48} \times \frac{1}{3} = \frac{77}{144}, \text{ Ans.}$$

$$53. \frac{7}{8} - \frac{6}{7} = \frac{49}{56} - \frac{48}{56} = \frac{1}{56}; \frac{1}{56} \text{ of the number} = 10;$$

$$\frac{56}{56} \text{ of the number} = 56 \times 10 = 560, \text{ Ans.}$$

$$54. \frac{5}{7} \text{ of } \frac{8}{18} \text{ of } \frac{4}{18} \text{ of } \frac{55}{4} \times \frac{11}{8} = \frac{11}{16}, \text{ Ans.}$$

$$55. \frac{3}{4} \text{ the cost} = \$105\frac{1}{4}; \frac{1}{4} \text{ the cost} = \frac{1}{3} \text{ of } \$105\frac{1}{4} = \$35\frac{1}{4};$$

$$\frac{4}{4} \text{ the cost} = 4 \times \$35\frac{1}{4} = \$141, \text{ Ans.}$$

$$56. 13\frac{7}{10} \times 7\frac{1}{8} = \frac{137}{10} \times \frac{63}{8} = \frac{8631}{80} = \$107\frac{11}{80}, \text{ Ans.}$$

$$57. \$3\frac{3}{4} \div 1\frac{1}{8} = \frac{15}{\frac{225}{64}} \times \frac{8}{1\beta} = \frac{15}{8} = \$1\frac{7}{8}, \text{ Ans.}$$

$$58. \$350\frac{1}{8} \div \$17\frac{1}{2} = \frac{79}{\frac{5609}{16}} \times \frac{4}{71} = \frac{79}{4} = 19\frac{3}{4}, \text{ Ans.}$$

59.

$$\frac{3}{8} \text{ cost } \$2.13; \frac{1}{8} \text{ cost } \frac{1}{3} \text{ of } \$2.13 = \$0.71; \frac{8}{8} \text{ cost } 8 \times \$0.71 = \$5.68;$$

$$10\frac{1}{2} \times \$5.68 = \$59.64, \text{ Ans.}$$

$$60. \frac{5}{5} - \frac{2}{5} = \frac{3}{5}; \frac{4}{7} \text{ of } \frac{3}{5}, \text{ or } \frac{12}{35}, = 24; \frac{1}{35} = 2; \frac{35}{35} = 70, \text{ Ans.}$$

$$61. \frac{3}{4} \text{ of } 28\frac{7}{8} \text{ men} = 21 \text{ men}; \frac{28 \times \frac{2}{42}}{21} = 56 \text{ days, Ans.}$$

$$62. 6\frac{1}{2} \times 1\frac{1}{2} \div \frac{3}{4} = \frac{27}{4} \times \frac{5}{4} \times \frac{4}{3} = \frac{45}{4} = 11\frac{1}{4} \text{ yards, Ans.}$$

$$63. \frac{5}{7} \text{ of } 1\frac{1}{13} = \frac{5}{7} \times \frac{19}{13} = \frac{95}{91}, \frac{24}{34} = \frac{19}{7} \times \frac{4}{13} = \frac{76}{91};$$

$$\frac{95}{91} \div \frac{76}{91} = \frac{95}{91} \times \frac{91}{76} = \frac{95}{76} = 1\frac{1}{4}, \text{ Ans.}$$

$$64. \frac{5}{16} + \frac{7}{12} = \frac{15}{48} + \frac{28}{48} = \frac{43}{48}; \frac{48}{48} - \frac{43}{48} = \frac{5}{48}, \text{ C.'s share.}$$

$$\left. \begin{array}{l} \frac{5}{16} \text{ of } \$960 = \$300, \text{ A.'s gain,} \\ \frac{7}{12} \text{ of } \$960 = \$560, \text{ B.'s gain,} \\ \frac{5}{48} \text{ of } \$960 = \$100, \text{ C.'s gain,} \end{array} \right\} \text{Ans.}$$

65.

$$\frac{7}{8} \text{ cost } \$\frac{9}{8}; \frac{1}{8} \text{ cost } \frac{1}{7} \text{ of } \frac{9}{8} = \$\frac{9}{56}; \frac{8}{8} \text{ cost } 8 \times \frac{9}{56} = \frac{9}{7} = \$1\frac{2}{7};$$

$$\$ \frac{9}{11} \div \$1\frac{2}{7} = \frac{9}{11} \times \frac{7}{9} = \frac{7}{11} \text{ gallon, Ans.}$$

$$66. \frac{2}{3} = \$3300; \frac{1}{3} = \frac{1}{2} \text{ of } \$3300 = \$1650;$$

$$\frac{3}{3} = 3 \times \$1650 = \$4950;$$

$$\frac{3}{10} \text{ of } \$4950 = \$1485, \text{ Ans.}$$

$$67. \$5\frac{7}{8} \div 7\frac{1}{4} = \frac{87}{10} \times \frac{4}{29} = \$\frac{3}{4}, \text{ cost of 1 pound;}$$

$$\$23\frac{3}{8} \div \$\frac{3}{4} = \frac{63}{8} \times \frac{4}{3} = \frac{63}{2} = 31\frac{1}{2} \text{ pounds, Ans.}$$

$$68. \$31\frac{1}{8} \div 4 = \frac{59}{16} \times \frac{1}{4} = \$\frac{59}{64}, \text{ cost of one bushel.}$$

$$\$ \frac{59}{64} \times 7 = \frac{413}{64} = \$6\frac{29}{64}, \text{ Ans.}$$

69.  $\$ \frac{3}{4} + \$ 1\frac{1}{2} = \$ 2\frac{1}{2}$ , what B receives ;

$$\frac{2}{3} \text{ of } 2\frac{1}{2} = \frac{2}{3} \text{ of } \frac{9}{2} = \$ 1\frac{1}{2}, \text{ what A receives.}$$

$$\$ 1\frac{1}{2} - \$ \frac{3}{4} = \frac{6}{4} - \frac{3}{4} = \$ \frac{3}{4}, \text{ Ans.}$$

70. A spends  $\frac{4}{4} - \frac{1}{4} = \frac{3}{4}$  of his income ;

B spends  $1\frac{1}{2} \times \frac{3}{4} = \frac{3}{2} \times \frac{3}{4} = \frac{9}{8}$  of his income ;

$$\frac{9}{8} - \frac{8}{8} = \frac{1}{8}, \text{ B spends more than income ; } \frac{1}{8} = \$ 62\frac{1}{2} ;$$

$$\frac{8}{8} = 8 \times \$ 62\frac{1}{2} = \$ 500, \text{ Ans.}$$

71. One pipe empties  $\frac{1}{5}$  of the contents in 1 minute ; the other pipe empties  $\frac{1}{7}$  of the contents in 1 minute ; together they empty  $\frac{1}{5} + \frac{1}{7}$  of the contents per minute.

$$\frac{1}{5} + \frac{1}{7} = \frac{5}{35} + \frac{7}{35} = \frac{12}{35}$$

7 out of every 12 parts, or  $\frac{7}{12}$ , runs through the larger pipe.

$\frac{7}{12}$  of 960 gal. = 560 gal. The remainder, or 400 gal., runs through the other pipe.

$$72. \frac{1}{6 + 7\frac{1}{2}} = 1 \times \frac{2}{27} = \frac{2}{27} ; \frac{3}{5} \text{ of } 1\frac{1}{2} = \frac{3}{5} \times \frac{3}{2} = 1 ;$$

$$1\frac{1}{2} \div 1\frac{1}{2} = \frac{9}{7} \times \frac{4}{5} = \frac{36}{35} ;$$

$$\frac{2}{27} + 1 + \frac{36}{35} + \frac{9}{35} = \frac{70}{945} + \frac{945}{945} + \frac{972}{945} + \frac{243}{945} = \frac{2230}{945} = 2\frac{446}{189}, \text{ Ans.}$$

**Article 142.**

54. 71.5.

55. 19.000; 43.600; 0.640; 53.000.

56. 15.60; 4.70; 13.00.

57. 18.0156; 401.6000; 176.4700.

63.  $\frac{2}{40}$ .64.  $\frac{1}{8}$ .**Article 143.**65.  $\frac{1}{40}$ .70.  $\frac{3}{8}$ .75.  $9\frac{3}{8}$ .79.  $\frac{1}{4}$ .66.  $\frac{581}{1000}$ .71.  $\frac{128}{125}$ .76.  $115\frac{1}{8}$ .

84. .6.

67.  $\frac{27}{800}$ .72.  $11\frac{1}{4}$ .77.  $\frac{11}{800}$ .86.  $.416\frac{2}{3}$ .68.  $\frac{3}{8}$ .73.  $4\frac{7}{8}$ .78.  $200\frac{3}{4}$ .87.  $.3636\frac{4}{11}$ .69.  $\frac{5}{8}$ .74.  $\frac{3}{32}$ .**Article 144.**

88. .275.

93. 4.096.

98. .5833.

89. .4375.

94. 4.015625.

99. .9474.

90. .03125.

95. 2.09375.

100.  $.0933\frac{1}{3}$ .

91. .7.

96. 5.0078125.

101. .135135.

92. .32.

97.  $.0769\frac{3}{13}$ .

102.

103.

104.

 $\frac{2}{3} = .667$  $15\frac{1}{2} = 15.8333$  $\frac{21}{38} = .553$  $20\frac{1}{2} = 20.6250$ 

15.057000

 $\frac{23}{200} = .012$  $12\frac{1}{2} = 12.8000$  $3\frac{41}{333} = 3.123123$  $\frac{1.232}{1.232}, \text{Ans.}$  $2.68 = \frac{2.6800}{2.6800}$  $\frac{11.933877}{11.933877}, \text{Ans.}$  $\frac{51.9383}{51.9383}, \text{Ans.}$ **Article 145.**

111. 671

112. 18.72

.3057.1

3355

1872

2013

13104

204.655, Ans.132.912, Ans.



**Article 146.**

<b>115.</b> 5.64 <u>45</u> 2820 <u>2256</u> 253.80, Ans.	<b>116.</b> 96.5 <u>100</u> 9650.0, Ans.	<b>117.</b> 6.34 <u>.0023</u> 1902 <u>1268</u> .014582, Ans.
<b>118.</b> 42.2 <u>2.004</u> 1688 <u>844</u> 84.5688, Ans.	<b>119.</b> 1671 <u>.013</u> 5013 <u>1671</u> 21.723, Ans.	<b>120.</b> .563 <u>47</u> 3941 <u>2252</u> 26.461, Ans.
<b>121.</b> 19634 <u>.0073</u> 58902 <u>137438</u> 143.3282, Ans.	<b>122.</b> .0703 <u>.0055</u> 3515 <u>3515</u> .00038665, Ans.	<b>123.</b> .0505 <u>.001</u> .0000505, Ans.
<b>124.</b> .0076 <u>.017</u> 532 <u>76</u> .0001292, Ans.	<b>125.</b> 1000000 <u>.000001</u> 1.000000, Ans.	<b>126.</b> \$ 4.50 <u>35.75</u> 2250 <u>3150</u> 2250 <u>1350</u> \$ 160.8750, Ans.
<b>127.</b> \$ 4.62 <u>13.375</u> 2310 <u>3234</u> 1386 <u>1386</u> 462 <u>462</u> \$ 61.79250, Ans.	<b>128.</b> .101 <u>.10101</u> 101 <u>101</u> 101 <u>101</u> .01020201, Ans.	<b>129.</b> 4 ) 1.264 <u>.316</u> , Ans.  <b>130.</b> .05 ) .00.115 <u>.023</u> , Ans.

**Article 147.****142.** 125.36, Ans.

$$\begin{array}{r}
 6 \overline{) 78350.00} \\
 \underline{625} \phantom{00} \\
 1585 \phantom{00} \\
 \underline{1250} \phantom{00} \\
 3350 \phantom{00} \\
 \underline{3125} \phantom{00} \\
 2250 \phantom{00} \\
 \underline{1875} \phantom{00} \\
 3750 \phantom{00} \\
 \underline{3750} \\
 0
 \end{array}$$

**143.** .756, Ans.

$$\begin{array}{r}
 0.25 \overline{) 0.18900} \\
 \underline{175} \phantom{00} \\
 140 \phantom{00} \\
 \underline{125} \phantom{00} \\
 150 \phantom{00} \\
 \underline{150} \\
 0
 \end{array}$$

**144.** .001, Ans.

$$\begin{array}{r}
 0.01 \overline{) 0.0101} \\
 \underline{10.01} \\
 0
 \end{array}$$

**145.** 790, Ans.

$$\begin{array}{r}
 0.0135 \overline{) 1.06650} \\
 \underline{945} \phantom{00} \\
 1215 \phantom{00} \\
 \underline{1215} \phantom{00} \\
 0
 \end{array}$$

**146.** .081, Ans.

$$\begin{array}{r}
 0.08 \overline{) 0.8748} \\
 \underline{864} \phantom{00} \\
 108 \phantom{00} \\
 \underline{108} \\
 0
 \end{array}$$

**147.** .893+, Ans.

$$\begin{array}{r}
 0.9147 \overline{) 8170.000} \\
 \underline{73176} \phantom{00} \\
 85240 \phantom{00} \\
 \underline{82323} \phantom{00} \\
 29170 \phantom{00} \\
 \underline{27441} \phantom{00} \\
 1729
 \end{array}$$

**148.** .001365, Ans.

$$\begin{array}{r}
 1000 \overline{) 1.365000} \\
 \underline{1000} \phantom{00} \\
 3650 \phantom{00} \\
 \underline{3000} \phantom{00} \\
 6500 \phantom{00} \\
 \underline{6000} \phantom{00} \\
 5000 \phantom{00} \\
 \underline{5000} \\
 0
 \end{array}$$

**149.** 4000, Ans.

$$\begin{array}{r}
 0.18 \overline{) 72.000} \\
 \underline{72} \phantom{00} \\
 000
 \end{array}$$

**150.** 150000, Ans.

10037. ) 5550000.

$$\begin{array}{r} 37 \\ \overline{185} \\ 185 \\ \hline 0000 \end{array}$$
**151.**

1.12, Ans.

100143. ) 100160.16

$$\begin{array}{r} 143 \\ \overline{171} \\ 143 \\ \hline 286 \\ \hline 286 \end{array}$$
**152.** 360.985—, Ans.

1264. ) 95300.000

$$\begin{array}{r} 792 \\ \overline{1610} \\ 1584 \\ \hline 2600 \\ 2376 \\ \hline 2240 \\ 2112 \\ \hline 1280 \\ 1056 \\ \hline 224 \end{array}$$
**153.**

15.004+, Ans.

712. ) 1080.290

$$\begin{array}{r} 72 \\ \overline{360} \\ 360 \\ \hline 290 \\ 288 \\ \hline 2 \end{array}$$
**154.**

210, Ans.

3175. ) 78750.

$$\begin{array}{r} 750 \\ \overline{375} \\ 375 \\ \hline 0 \end{array}$$
**MISCELLANEOUS EXERCISES.****155.** .0403

400.0003

**156.** 0.00567

2.13007

1.00157

**157.** .0087

.00162

.000009

**158.**  $4\frac{3}{8} + 1\frac{3}{8} = 4\frac{15}{8} + \frac{3}{8} = 4\frac{18}{8} = 5\frac{1}{2} = 5.325$ , Ans.

$$\begin{array}{r}
 159. \quad 45.00000 \\
 \underline{36.00073} \\
 8.99927, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 160. \quad 25.7 \\
 \quad 8.389 \quad 58.000 \\
 \underline{23.056} \quad 57.145 \\
 57.145 \quad \underline{.855}, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 161. \quad 6346.0000 \\
 \underline{.6346} \\
 6345.3654, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 162. \quad 3\frac{3}{4} = 3.625 \\
 17\frac{1}{4} = 17.250 \\
 476 = 476.000 \\
 3.125 = 3.125 \\
 \underline{500.000}, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 4.2000 \\
 \underline{.0042} \\
 4.1958, \text{ Ans.}
 \end{array}$$

163.

$$.03125 = \frac{3125}{100000} = \frac{1}{32}, \text{ Ans.}$$

$$\begin{array}{r}
 .0000500 \\
 \underline{.0000005} \\
 .0000495, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 164. \quad 4 = 4.0000 \\
 2\frac{3}{4} = 2.7500 \\
 17 = 17.0000 \\
 .136 = .1360 \\
 .0408 = .0408 \\
 \underline{23.9268}, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 165. \quad 365.250000 \\
 \underline{365.242264} \\
 .007736 \\
 \underline{1880} \\
 618880 \\
 61888 \\
 \underline{7736}
 \end{array}$$

Ans. 14.543680 days.

$$\begin{array}{r}
 166. \quad 7423.973 \\
 \underline{.413} \\
 7423.560 \\
 \\
 612, \text{ Ans.}
 \end{array}$$

$$\begin{array}{r}
 167. \quad \$ 7498.70 \\
 \underline{749.83} \\
 \$ 6748.87
 \end{array}$$

$$\begin{array}{r}
 12|130.) \quad 7423560. \\
 \underline{72780} \\
 14556 \\
 \underline{12130} \\
 24260 \\
 \underline{24260}
 \end{array}$$

$$\frac{1}{3} \text{ of } \$ 6748.87 = \$ 2249.62\frac{1}{3}, \text{ C's;}$$

$$\frac{1}{3} \text{ of } \$ 6748.87 = \$ 2249.62\frac{1}{3}, \text{ B's;}$$

$$\begin{array}{r}
 \$ 2249.62\frac{1}{3} + 749.83 = \\
 \$ 2999.45\frac{1}{3}, \text{ A's, Ans.}
 \end{array}$$

$$168. 20.104 \times 5.07 = 101.92728$$

$$6.44 \div .005 = 1288$$

20004.

$$\begin{array}{r} 101.92728 \\ \hline \end{array}$$

$$\begin{array}{r} 20105.92728 \\ \hline \end{array}$$

1288.

$$\begin{array}{r} 18817.92728, \text{ Ans.} \\ \hline \end{array}$$

$$169. 2\frac{3}{4} = 2.667$$

$$4\frac{3}{8} = 4.553$$

$$51.652 = 51.652$$

$$\begin{array}{r} 58.872, \text{ Ans.} \\ \hline \end{array}$$

170.

\$ 968.4900

$$\$ 968.49 \times 3.4 = \$ 3292.8660$$

$$\$ 3292.866 \times 3.7 = \$ 12183.6042$$

$$\$ 16444.9602, \text{ Ans.}$$

171.

4.9835, Ans.

$$30 \overline{) 25} ) 150 \overline{) 75.0000}$$

$$\begin{array}{r} 12100 \\ \hline \end{array}$$

29750

27225

$$\begin{array}{r} 25250 \\ \hline \end{array}$$

24200

$$\begin{array}{r} 10500 \\ \hline \end{array}$$

9075

$$\begin{array}{r} 14250 \\ \hline \end{array}$$

12100

$$\begin{array}{r} 2150 \\ \hline \end{array}$$

172.

$$1 \div .01 = 100$$

$$.4 \times .0005 = .0002$$

$$.002 \times .0125 = .000025$$

$$.0002 + .000025 = .000225$$

$$.0009 \div .000225 = 4$$

$$100 - 4 = 96, \text{ Ans.}$$

$$173. 6116.$$

.027

$$\begin{array}{r} 42812 \\ \hline \end{array}$$

12232

$$\begin{array}{r} 165.132 \\ \hline \end{array}$$

.003

$$\begin{array}{r} 165.135, \text{ Ans.} \\ \hline \end{array}$$

**174.** 63 bushels. \$ 1.12, 1 bush. sold for.

94.) 59|22.

564

282

282

63 ) 70.56

63

75

63

126

126

\$ 1.12 — \$ 0.94 = \$ 0.18 gain, Ans.

**175.** 9.) \$ 6|6.6

\$ 7.4

60.5

37 0

444

\$ 447.70, Ans.

**176.** .064  $\frac{2}{3}$

.3

.0194

\$ 1728

1552

388

1358

194

\$ 33.5232 = \$ 33  $\frac{2}{3}$ , Ans.

**177.** 12.8 ÷ .16 = 80

.128 ÷ .0016 = 80

80

80 = 1, Ans.

**178.** .012 =  $\frac{1}{840}$ , Ans.

**179.**

\$ 3.75 ÷ .6875 = \$ 5  $\frac{1}{2}$ , cost of 1 gal.

40.25

\$ 5  $\frac{1}{2}$

20125

1829  $\frac{1}{2}$

\$ 219.54  $\frac{1}{2}$ , Ans.

**180.**

\$ 15  $\frac{1}{2}$

8

\$ 127, cost of 1 acre.

46.78

1016

889

762

508

\$ 5941.06, Ans.

$$181. \$14.40 \div \$0.18\frac{4}{5} = 1440 \times \frac{6}{113} = \frac{8640}{113} = 76\frac{52}{113} \text{ lb., Ans.}$$

$$182. \quad 68\frac{437}{896} \text{ tons, Ans.}$$

$$\begin{array}{r} 35 \overline{)84.} \quad 2458,60. \\ \underline{21504} \\ 30820 \\ \underline{28672} \\ 2148 \\ \underline{2148} \quad 537 \\ 3584 = 896 \end{array}$$

$$183.$$

$$\begin{array}{r} 408. \overline{)4800.} \\ \underline{600, \text{ number.}} \\ .7 \\ \underline{420.0, \text{ Ans.}} \end{array}$$

$$184.$$

$$\begin{array}{r} .024 \\ .06 \quad 4000, \text{ Ans.} \\ \hline 00144. \overline{)576000.} \\ \underline{576} \\ 000 \end{array}$$

$$185.$$

$$\left( \frac{5}{6} \div .33\frac{1}{3} \right) = \frac{5}{6} \times \frac{3}{1} = \frac{5}{2} = 2\frac{1}{2}$$

$$\left( .87\frac{1}{2} \div \frac{1}{8} \right) = \frac{7}{8} \times \frac{8}{1} = 7$$

$$7 \times 2\frac{1}{2} = 17\frac{1}{2}; \quad 7 - 2\frac{1}{2} = 4\frac{1}{2}$$

$$17\frac{1}{2} \div 4\frac{1}{2} = \frac{35}{2} \times \frac{2}{9} = \frac{35}{9} = 3\frac{8}{9}, \text{ Ans.}$$

### Article 154.

$$23. \$13.50$$

$$\begin{array}{r} 2.63 \\ 5.00 \\ 6.13 \\ \hline \$27.26, \text{ Ans.} \end{array}$$

$$24. \$0.63$$

$$\begin{array}{r} 0.80 \\ 7.50 \\ 32.00 \\ \hline \$40.93, \text{ Ans.} \end{array}$$

$$25.$$

$$\begin{array}{r} \$6500.00 \\ 1356.85 \\ \hline \$5143.15, \text{ Ans.} \end{array}$$

$$26. \$0.14$$

$$\begin{array}{r} 56 \\ 84 \\ 70 \\ \hline \$7.84 \end{array}$$

$$128$$

$$\begin{array}{r} \$0.09 \\ \$11.52 \\ 7.84 \\ \hline \$19.36, \text{ Ans.} \end{array}$$

$$27.$$

$$\begin{array}{r} 250 \text{ yd., Ans.} \\ \$0/19. \overline{) \$4750.} \\ \underline{38} \\ 95 \\ \hline 95 \end{array}$$

28. 
$$\begin{array}{r} 491 \\ \$0.81 \\ \hline 491 \\ 3928 \\ \hline \$397.71 \end{array}$$
- $$\begin{array}{r} 491 \\ 29 \\ \hline 462 \\ \$0.95 \\ \hline 2310 \\ 4158 \\ \hline \$438.90 \\ 397.71 \\ \hline \$41.19, \text{ Ans.} \end{array}$$
29. 
$$\begin{array}{r} \$7975 \\ 4560 \\ \hline \$3415, \text{ cost of land.} \end{array}$$
- $$\begin{array}{r} \$94.86+, \text{ Ans.} \\ 36) \$3415.00 \\ 324 \\ \hline 175 \\ 144 \\ \hline 310 \\ 288 \\ \hline 220 \\ 216 \\ \hline 4 \end{array}$$
30. 
$$\begin{array}{r} \$37.50 \\ 187 \\ \hline 26250 \\ 30000 \\ 3753 \\ \hline \$7012.50 \\ 8253 \\ \hline \$15265.50 \end{array}$$
- $$\begin{array}{r} \$63 \\ 131 \\ \hline 63 \\ 189 \\ 63 \\ \hline \$8253 \end{array}$$
- $$\begin{array}{r} 187 \\ 131 \\ \hline 318 \text{ acres.} \end{array}$$
- $$\begin{array}{r} \$48.00+, \text{ Ans.} \\ 318) \$15265.50 \\ 1272 \\ \hline 2545 \\ 2544 \\ \hline 150 \end{array}$$
31. 
$$\begin{array}{r} 44\frac{2}{3}, \text{ Ans.} \\ \$0/67. ) \$29/70. \\ 268 \\ \hline 290 \\ 268 \\ \hline 22 \end{array}$$
32. 
$$\begin{array}{r} \$0/09. ) \$68/40. \\ 760, \text{ Ans.} \end{array}$$
33. 
$$\begin{array}{r} 7) \$26.25 \\ \$3.75, \text{ cost of 1 bbl.} \\ 43.50 \\ \hline 18750 \\ 1125 \\ 1500 \\ \hline \$163.1250, \text{ or } \$163.12\frac{1}{2}, \text{ Ans.} \end{array}$$



## 34.

\$ 20.40	15.50 $\frac{1}{4}$ acres.	\$ 1040.98
35.45	20 $\frac{1}{2}$ 50. ) 317/80.00	723.18
<u>10200</u>	205 0	<u>\$ 317.80</u>
8160	<u>112 80</u>	
10200	102 50	35.45
6120	<u>10 300</u>	15.50 $\frac{1}{4}$
<u>\$ 723.1800</u>	10 250	50.95 $\frac{1}{4}$ , Ans.
	<u>500</u>	
	2050 = $\frac{10}{41}$	

## Article 156.

44. \$ 1.37  $\frac{1}{2}$  = \$ 1 + \$  $\frac{3}{8}$

$$\begin{array}{r} \$ 144 = \text{cost at } \$ 1 \\ 54 = \text{ " } \frac{3}{8} \\ \text{Ans. } \$ 198 = \text{ " } \$ 1 \frac{3}{8} \end{array}$$

45. \$ 0.66  $\frac{2}{3}$  = \$  $\frac{2}{3}$

$$\frac{28}{84} \times \frac{2}{3} = \$ 56, \text{ Ans.}$$

46. \$ 3.87  $\frac{1}{2}$  = \$ 3 + \$  $\frac{7}{8}$

$$\begin{array}{r} \$ 60 = \text{cost at } \$ 1. \\ \$ 180.00 = \text{cost at } \$ 3 \\ 52.50 = \text{ " } \frac{7}{8} \\ \text{Ans. } \$ 232.50 = \text{ " } \$ 3.87 \frac{1}{2} \end{array}$$

47. \$ 5.12  $\frac{1}{2}$  = \$ 5.125

$$\begin{array}{r} 98 \text{ doz., Ans.} \\ \$ 5 \frac{1}{2} (125.) \$ 502/250. \\ 461 \ 25 \\ \hline 41 \ 000 \\ \hline 41 \ 000 \end{array}$$

48. 18, Ans.

$$\begin{array}{r} \$ 1 \frac{1}{2} (25.) \$ 29/250. \\ 16 \ 25 \\ \hline 13 \ 000 \\ \hline 13 \ 000 \end{array}$$

49. \$ 0.87  $\frac{1}{2}$  = \$  $\frac{7}{8}$

$$\frac{7}{56} \times \frac{7}{8} = \$ 49, \text{ Ans.}$$

$$51. \$0.37\frac{1}{2} = \$0.375$$

50.

2 117, Ans.

$$\$2.25 = \$2 + \$\frac{1}{4}$$

$$\$0\overline{)375.} ) \$793\overline{)875.}$$

$$\$302 = \text{earn at } \$1$$

750

$$\$604.00 = \text{earn at } \$2$$

438

$$75.50 = \text{ " } .25$$

375

$$\text{Ans. } \$679.50 = \text{ " } \$2.25$$

637

375

2625

2625

$$53. 1360 = 13.60 \text{ hund. ; } \$0.37\frac{1}{2} = \$\frac{3}{8} ; 13.60 \times \frac{3}{8} =$$

\$5.10, Ans.

$$54. 650 = 6.50, \text{ or } 6\frac{1}{2} \text{ hundreds ; } 6\frac{1}{2} \times \$12.50 = \$81.25, \text{ Ans.}$$

$$56. 5650 = 5.65 \text{ M. ; } 5.65 \times \$44 = \$248.60, \text{ Ans.}$$

$$57. 4565 = 4.565 \text{ M. ; } 4.565 \times \$23 = \$104.995$$

$$13640 = 13.64 \text{ M. ; } 13.64 \times \$53.55 = \$730.422$$

$$15250 = 15\frac{1}{4} \text{ thousands ; } 15\frac{1}{4} \times \$4.50 = \$68.625$$

\$104.995

730.422

68.625

\$904.042, Ans.

$$59. 8375 = 8.375 \text{ M. ; } \$100.50 \div 8.375 = \$12, \text{ Ans.}$$

$$60. 650 = 6.50, \text{ or } 6\frac{1}{2} \text{ hundreds ; } \$81.25 \div 6\frac{1}{2} = \$12.50, \text{ Ans.}$$

$$61. \quad \$30, \text{ sold 1 acre for.} \quad \$31.50$$

$$75.8 ) \$2274.0$$

30

2274

Ans. \$1.50, loss per acre.

0

**Article 159.****62.**

HENRY OTIS,

In Account with JAMES DELANY, Dr.

1881.

Jan. 3	To 1 bbl. Molasses, 44 gal. ....@ 55¢.....	\$ 24	20
" "	" 100 lb. Carolina Rice ..... " 7¢.....	7	00
Feb. 8	" 50 lb. Mocha Coffee ..... " 28¢.....	14	00
Mar. 17	" 1 bbl. Sugar, 328 lb. .... " 9¢.....	29	52
Apr. 22	" 1 box Tea, 35 lb. .... " 45¢.....	15	75
		\$ 90.47	

**63.***New York, May 16, 1881.*

MR. JAMES COOPER,

Bought of ARTHUR GILMAN &amp; Co.

5 bbl. Clear Pork .....@ \$ 20.50.....	\$ 102	50
3 bbl. New Mess Beef ..... " 12.50.....	37	50
2 bbl. Lard, 421 lb. .... " 0.11.....	46	31
364 lb. Smoked Ham ..... " 0.10.....	36	40
		\$ 222.71

*Received Payment,*

ARTHUR GILMAN &amp; Co.

**64.***Providence, June 11, 1881.*

MR. WILLIAM BAKER,

To JOHN O'BRIEN, Dr.

To 6 days' Labor.....@ \$ 2.50.....	\$ 15	00
" 6 days' Labor of Boy..... " 1.25.....	7	50
" 2 bbl. Rockland Lime .... " 0.95.....	1	90
" 3450 Bricks, per M. .... " 12.00.....	41	40
" Carting ..... " 2.75.....	2	75
		\$ 68 55
Cr.		
By 1 Month's Rent .....\$ 10.00.....	10	00
		\$ 58.55

*Received Payment,*

JOHN O'BRIEN,

*By PETER O'BRIEN.*

65.

*Burlington, July 19, 1881.*

MR. GEORGE ALLEN,

Bought of ALBERT LANE &amp; SONS.

1881.

May 9	61 yd. American Prints .....	@ 7 ¢.....	\$ 4 27
" 11	84 yd. Avon Sheeting .....	" 8 ¢.....	6 72
" 13	94 yd. Samoset Ticking .....	" 19 ¢.....	17 86
June 7	10 doz. Merino Hose .....	" \$ 2.24.....	22 40
" 11	83 yd. Prints .....	" 6 ¢.....	4 98
			\$ 56.23

*Paid, July 21, 1881,*

ALBERT LANE &amp; SONS.

66.

*New Orleans, July 1, 1882.*

HARLAN, JONES, &amp; Co.,

In Account with FELIX REMOND, Dr.

1882.

June 3	15 bbl. N. P. Flour .....	@ \$ 8.25.....	\$ 123 75
" 5	10 bbl. St. Louis Flour.....	" 7.40.....	74 00
" 9	3 tubs Butter, 121 lb.....	" .30.....	36 30
" 15	125 lb. Smoked Ham.....	" .10.....	12 50
" 25	43 lb. Cheese.....	" .11.....	4 73
			251 28
Cr.			
" 9	Merchandise .....	\$ 96.50	
" 15	Cash .....	50.00	146 50
Balance due F. R.....			\$ 104.78

*Received Payment, July 3, 1882,*

FELIX REMOND.

67.

*Trenton, Oct. 3, 1881.*

ANDREW SHAW,

Bought of INGRAM, SMITH, &amp; Co.

25 pairs	Kip Boots .....	@ \$ 2.50...	\$ 62 50
20 "	Calf Boots .....	" 2.75...	55 00
30 "	New Brunswick Rub. Boots ..	" 3.00...	90 00
15 "	Kip Brogan Shoes .....	" 1.25...	18 75
Carting .....			25
			\$ 226.50

68.

*St. Paul, Sept. 15, 1881.*

JACOB VAN HUSEN,

Bought of HOOPER, BLAKE, &amp; DUDLEY.

100 bbl Best Test Patent Flour @ \$ 8.25...	\$ 825 00
50 bbl Wilbur's Extra Flour..... " 6.50...	325 00
Freight .....	6 25
	<b>\$ 1156.25</b>

*Received Payment,*

HOOPER, BLAKE, &amp; DUDLEY.

69.

*June 1, 1881.*

JOSEPH MCINTIRE,

To ..... Dr.

To Services, 3 months .....@ \$ 28.....\$ 84.00

*Received Payment,*

70.

*Chicago, Nov. 1, 1882.*

WILLIAM ASBURY,

In Account with GEORGE W. OGDEN &amp; BRO.

1881.

Oct. 2	To 50 tons Franklin Coal .....@ \$ 5.25...	\$ 262 50
" 10	" 75 " Cumberland Coal ... " 4.75...	356 25
" 16	" 25 cords Pine Wood ..... " 4.75...	118 75
		<b>737 50</b>
	Cr.	
" 10	By Cash ..... \$ 262.50	
" 20	" Merchandise ..... 31.65	294 15
		<b>\$ 443.35</b>

*Received Payment,*

GEORGE W. OGDEN &amp; BROTHER.

## 71.

Nov. 10, 1881.

ARTHUR ROBERTS,

Bought of JORDAN, MARSH, &amp; Co.

64½ yd. Tapestry Carpet.....@	87½¢...	\$ 56	44
27 " Brussels Carpet..... "	\$ 1.85...	49	95
18¾ " Oilcloth..... "	37½¢...	7	03
Making and laying.....		13	22
		\$ 126	64

**Article 187.**

13. 19 bu. 3 pk. 7 qt. 1 pt.      14. 48 cu. yd. 15 cu. ft.

4  
 79 pk.  
 8  
 639 qt.  
 2

Ans. 1279 pt.

27  
 351  
 96

Ans. 1311 cu. ft.

15. 17 T. 17 cwt. 90 lb.

20  
 357 cwt.  
 100

Ans. 35790 lb.

**Article 188.**

16.

17.

12 A. 144 sq. rd. 144 sq. ft.      5 cu. yd. 23 cu. ft. 725 cu. in.

160  
 864  
 12  
 2064 sq. rd.  
 272½  
 4272

14448

4128

516

Ans. 562068 sq. ft.

27  
 38  
 12  
 158 cu. ft.  
 1728  
 1264  
 316  
 1106  
 158725

Ans. 273749 cu. in.

18. 60 gal. 3 qt. 1 pt.

$$\begin{array}{r} 4 \\ 243 \text{ qt.} \\ 2 \\ \hline \text{Ans. } 487 \text{ pt.} \end{array}$$

19. 13 bu. 2 pk. 7 qt. 1 pt.

$$\begin{array}{r} 4 \\ 54 \text{ pk.} \\ 8 \\ 439 \text{ qt.} \\ 2 \\ \hline \text{Ans. } 879 \text{ pt.} \end{array}$$

20. 47 mi.

$$\begin{array}{r} 320 \\ 940 \\ 141 \\ \hline 15040 \text{ rd.} \\ 16\frac{1}{2} \\ \hline 90240 \\ 15040 \\ 7520 \\ \hline \text{Ans. } 248160 \text{ ft.} \end{array}$$

21. 72 lb. 10 oz. 15 pwt. 7 gr.

$$\begin{array}{r} 12 \\ 874 \text{ oz.} \\ 20 \\ \hline 17495 \text{ pwt.} \\ 24 \\ \hline 69987 \\ 34990 \\ \hline \text{Ans. } 419887 \text{ gr.} \end{array}$$

22.

$$\begin{array}{r} 43 \text{ T. } 13 \text{ cwt. } 20 \text{ lb.} \\ 20 \\ \hline 873 \text{ cwt.} \\ 100 \\ \hline \text{Ans. } 87320 \text{ lb.} \end{array}$$

23. 365 d. 5 h. 48 m. 50 sec.

$$\begin{array}{r} 24 \\ 1465 \\ 730 \\ \hline 8765 \text{ h.} \\ 60 \\ \hline 525948 \text{ m.} \\ 60 \\ \hline \text{Ans. } 31556930 \text{ sec.} \end{array}$$

24. 8 cu. yd. 10 cu. ft. 728 cu. in.

$$\begin{array}{r} 27 \\ 56 \\ 17 \\ \hline 226 \text{ cu. ft.} \\ 1728 \\ \hline 2536 \\ 452 \\ \hline 1582 \\ 226 \\ \hline \text{Ans. } 391256 \text{ cu. in.} \end{array}$$

25.

$$\begin{array}{r} 45^\circ 28' 54'' \\ 60 \\ \hline 2728' \\ 60 \\ \hline \text{Ans. } 163734'' \end{array}$$

26. 25 cd.

128

200

50

25

Ans. 3200 cu. ft.

27. 40 gal. 3 qt. 0 pt. 2 gi.

4

163 qt.

2

326 pt.

4

Ans. 1306 gi.

28. 67 wk. 6 d. 9 h. 52 min.

7

475 d.

24

1900

9509

11409 h.60

Ans. 684592 min.

29. 4 bundles 1 ream

2

9 reams

20

180 quires

24

720

360

Ans. 4320 sheets.

30. 1 A. 80 sq. rd.

160

240 sq. rd.

272½

480

1680

48060

65340 sq. ft.

\$ 0.05 × 65340 = \$ 3267, Ans.

31. 3 mi. 195 rd.

320

960

195

1155 rd.

\$ 5.50 × 1155 = \$ 6352.50, Ans.

33.

1 mi. = 1760 yd.;  $\frac{1}{20}$  mi. =  $\frac{1}{20}$  of  $\frac{88}{1760}$  yd. = 88 yd., Ans.

34.

1 lb. = 5760 gr.;  $\frac{1}{3}$  lb. =  $\frac{1}{3}$  of  $\frac{2}{5760}$  gr. =  $\frac{2}{3}$  gr., Ans.



35.

$$1 \text{ d.} = 86400 \text{ sec. ; } \frac{1}{28800} \text{ d.} = \frac{1}{28800} \text{ of } 86400 \text{ sec.} = \frac{27}{288} \text{ sec., Ans.}$$

$$36. 1 \text{ gal.} = 32 \text{ gi. ; } \frac{7}{288} \text{ gal.} = \frac{7}{288} \text{ of } 32 \text{ gi.} = \frac{7}{9} \text{ gi., Ans.}$$

$$37. 1 \text{ bushel} = 32 \text{ quarts ; } \quad 39. .024 \text{ ton}$$

$$\frac{2}{15} \text{ bu.} = \frac{2}{15} \text{ of } 32 \text{ qt.} = \frac{64}{15} = 4\frac{4}{15} \text{ qt., Ans.} \quad \text{Ans. } \frac{2000}{48.000} \text{ lb.}$$

40. .0075 A.	41. .3945 d.	42. 1.364 A.
$\begin{array}{r} 160 \\ 4500 \end{array}$	$\begin{array}{r} 24 \\ 15780 \end{array}$	$\begin{array}{r} 160 \\ 81840 \end{array}$
$\begin{array}{r} 75 \\ 1.2000 \text{ sq. rd.} \end{array}$	$\begin{array}{r} 7890 \\ 9.4680 \text{ h.} \end{array}$	$\begin{array}{r} 1364 \\ 218.240 \text{ sq. rd.} \end{array}$
$\begin{array}{r} 272\frac{1}{2} \\ 24000 \end{array}$	$\begin{array}{r} 60 \\ \text{Ans. } 568.0800 \text{ min.} \end{array}$	$\begin{array}{r} 30\frac{1}{2} \\ 6547200 \end{array}$
$\begin{array}{r} 84000 \\ 24000 \end{array}$		$\begin{array}{r} 54560 \\ \text{Ans. } 6601.760 \text{ sq. yd.} \end{array}$
$\begin{array}{r} 3000 \\ \text{Ans. } 326.7000 \text{ sq. ft.} \end{array}$		

**Article 189.**

51. $2 \overline{) 1279} \text{ pt.}$	52. $27 \overline{) 1311} \text{ cu. ft.}$
$8 \overline{) 639} + 1 \text{ pt.}$	$48 + 15 \text{ cu. ft.}$
$4 \overline{) 79} + 7 \text{ qt.}$	Ans. 48 cu. yd. 15 cu. ft.
$19 + 3 \text{ pk.}$	

Ans. 19 bu. 3 pk. 7 qt. 1 pt.

$$53. 100 \overline{) 35790} \text{ lb.}$$

$$20 \overline{) 357} + 90 \text{ lb.}$$

$$17 \text{ T.} + 17 \text{ cwt.}$$

Ans. 17 T. 17 cwt. 90 lb.

## Article 190.

$$54. \quad 272\frac{1}{4} \overline{) 562068 \text{ sq. ft.}}$$

$$\begin{array}{r} 4 \phantom{0000} \\ 1089 \overline{) 2248272} \end{array}$$

$$160 \overline{) 2064 \text{ sq. rd. } 4\frac{1}{4} \text{ or } 144 \text{ sq. ft.}}$$

$$12 \overline{) 144 \text{ sq. rd.}}$$

Ans. 12 A. 144 sq. rd. 144 sq. ft.

$$55. \quad 1728 \overline{) 273749 \text{ cu. in.}}$$

$$27 \overline{) 158 \text{ cu. ft. } 725 \text{ cu. in.}}$$

$$5 \overline{) 23 \text{ cu. yd. } 23 \text{ cu. ft.}}$$

Ans. 5 cu. yd. 23 cu. ft. 725 cu. in.

$$56. \quad 2 \overline{) 487 \text{ pt.}}$$

$$4 \overline{) 243 \text{ qt. } 1 \text{ pt.}}$$

$$60 \overline{) 3 \text{ gal. } 3 \text{ qt.}}$$

Ans. 60 gal. 3 qt. 1 pt.

$$57. \quad 2 \overline{) 879 \text{ pt.}}$$

$$8 \overline{) 439 \text{ qt. } 1 \text{ pt.}}$$

$$4 \overline{) 54 \text{ pk. } 7 \text{ qt.}}$$

$$13 \overline{) 2 \text{ bu. } 2 \text{ pk.}}$$

Ans. 13 bu. 2 pk. 7 qt. 1 pt.

$$58. \quad 16\frac{1}{2} \overline{) 248160 \text{ ft.}}$$

$$2 \overline{) 2}$$

$$33 \overline{) 496320}$$

$$320 \overline{) 15040 \text{ rd.}}$$

Ans. 47 mi.

$$59. \quad 24 \overline{) 419887 \text{ gr.}}$$

$$20 \overline{) 17495 \text{ pwt. } 7 \text{ gr.}}$$

$$12 \overline{) 874 \text{ oz. } 15 \text{ pwt.}}$$

$$72 \overline{) 10 \text{ lb. } 10 \text{ oz.}}$$

Ans. 72 lb. 10 oz. 15 pwt. 7 gr.

$$60. \quad 100 \overline{) 87320 \text{ lb.}}$$

$$20 \overline{) 873 \text{ cwt. } 20 \text{ lb.}}$$

$$43 \overline{) 13 \text{ T. } 13 \text{ cwt.}}$$

Ans. 43 T. 13 cwt. 20 lb.

$$61. \quad 60 \overline{) 31556930 \text{ sec.}}$$

$$60 \overline{) 525948 \text{ min. } 50 \text{ sec.}}$$

$$24 \overline{) 8765 \text{ h. } 48 \text{ min.}}$$

$$365 \overline{) 5 \text{ d. } 5 \text{ h.}}$$

Ans. 365 d. 5 h. 48 min. 50 sec.

62.  $1728 \overline{) 391256}$  cu. in.

$27 \overline{) 226}$  cu. ft. 728 cu. in.

$8$  cu. yd. 10 cu. ft.

Ans. 8 cu. yd. 10 cu. ft. 728 cu. in.

63.  $60 \overline{) 163734''}$

$60 \overline{) 2728'}$  54''

45° 28'

Ans. 45° 28' 54''.

64.  $128 \overline{) 3200}$  cu. ft.

Ans. 25 cu. yd.

65.  $4 \overline{) 1306}$  gi.

$2 \overline{) 326}$  pt. 2 gi.

$4 \overline{) 163}$  qt.

40 gal. 3 qt.

Ans. 40 gal. 3 qt. 0 pt. 2 gi.

66.  $60 \overline{) 684592}$  min.

$24 \overline{) 11409}$  h. 52 min.

$7 \overline{) 475}$  d. 9 h.

$67$  w. 6 d.

Ans. 67 w. 6 d. 9 h. 52 min.

67.  $24 \overline{) 4320}$  sheets.

$20 \overline{) 180}$  quires.

$2 \overline{) 9}$  reams.

4 bundles 1 ream.

Ans. 4 bundles 1 ream.

68.  $.05 \overline{) 3267.00}$

$272\frac{1}{4} \overline{) 65340}$  sq. ft.

$4 \overline{) 4}$

$1089 \overline{) 261360}$

$160 \overline{) 240}$  sq. rd.

Ans. 1 A. 80 sq. rd.

69.

$5.50 \overline{) 6352.50}$

$320 \overline{) 1155}$  rd.

Ans. 3 mi. 195 rd.

71. 1 mi. = 1760 yd. 1 yd. =  $\frac{1}{1760}$  mi.

$88 \text{ yd.} = 88 \times \frac{1}{1760} \text{ mi.} = \frac{1}{20} \text{ mi., Ans.}$

72. 1 lb. = 5760 gr. 1 gr. =  $\frac{1}{5760}$  lb.

$3000 \text{ gr.} = 3000 \times \frac{1}{5760} \text{ lb.} = \frac{25}{48} \text{ lb., Ans.}$

73. 1 day = 86400 sec. 1 sec. =  $\frac{1}{86400}$  day.

$$12600 \text{ sec.} = \cancel{12600}^7 \times \frac{1}{\cancel{86400}_{48}} \text{ day} = \frac{7}{48} \text{ day, Ans.}$$

74. 1 gal. = 32 gi. 1 gi. =  $\frac{1}{32}$  gal.

$$24 \text{ gi.} = \cancel{24}^3 \times \frac{1}{\cancel{32}_4} \text{ gal.} = \frac{3}{4} \text{ gal., Ans.}$$

75. 1 bu. = 32 qt. 1 qt. =  $\frac{1}{32}$  bu.

$$4\frac{4}{15} \text{ qt.} = 4\frac{4}{15} \times \frac{1}{\cancel{32}^2} \text{ bu.} = \frac{\cancel{64}^2}{15} \times \frac{1}{\cancel{32}} = \frac{2}{15} \text{ bu., Ans.}$$

77.  $2000 \overline{) 48.000} \text{ lb.}$   
Ans. .024 T.

78.  $272\frac{1}{2} \overline{) 326.7} \text{ sq. ft.}$   
 $\begin{array}{r} 4 \phantom{00} \\ 1089 \overline{) 1306.8} \end{array}$

79.  $60 \overline{) 568.080} \text{ min.}$   
 $24 \overline{) 9.468} \text{ h.}$   
Ans. .3945 d.

$160 \overline{) 1.2000} \text{ sq. rd.}$   
Ans. .0075 A.

80.  $30\frac{1}{2} \overline{) 6601.76} \text{ sq. yd.}$   
 $\begin{array}{r} 4 \phantom{00} \\ 121 \overline{) 26407.04} \end{array}$   
 $160 \overline{) 218.240} \text{ sq. rd.}$   
Ans. 1.364 A.

### Article 191.

83.  $\frac{2}{3} \text{ mi.} = \frac{2}{9} \text{ of } 320 \text{ rd.} = 71\frac{1}{3} \text{ rd.}$

$\frac{1}{3} \text{ rd.} = \frac{1}{9} \text{ of } 16\frac{1}{2} \text{ ft.} = 1\frac{2}{3} \text{ ft.}$

$\frac{5}{6} \text{ ft.} = \frac{5}{6} \text{ of } \cancel{12}^2 \text{ in.} = 10 \text{ in.}$

Ans. 71 rd. 1 ft. 10 in.

90. .53 rd. = .53 of  $5\frac{1}{2}$  yd. = 2.915 yd.  
 .915 yd. = .915 of 3 ft. = 2.745 ft.  
 .745 ft. = .745 of 12 in. = 8.94 in.

Ans. 2 yd. 2 ft. 8.94 in.

### Article 192

91.  $\frac{3}{7}$  A. =  $\frac{3}{7}$  of 160 sq. rd. =  $68\frac{4}{7}$  sq. rd.  
 $\frac{4}{7}$  sq. rd. =  $\frac{4}{7}$  of  $272\frac{1}{2}$  sq. ft. =  $155\frac{4}{7}$  sq. ft.  
 $\frac{4}{7}$  sq. ft. =  $\frac{4}{7}$  of 144 sq. in. =  $82\frac{4}{7}$  sq. in.

Ans. 68 sq. rd. 155 sq. ft.  $82\frac{4}{7}$  sq. in.

92.  $\frac{8}{9}$  lb. =  $\frac{8}{9}$  of 12 oz. =  $10\frac{8}{9}$  oz.  
 $\frac{2}{3}$  oz. =  $\frac{2}{3}$  of 20 pwt. =  $13\frac{1}{3}$  pwt.  
 $\frac{1}{3}$  pwt. =  $\frac{1}{3}$  of 24 gr. = 8 gr.

Ans. 10 oz. 13 pwt. 8 gr.

93.  $\frac{7}{11}$  y. =  $\frac{7}{11}$  of 365 d. =  $232\frac{7}{11}$  d.  
 $\frac{3}{11}$  d. =  $\frac{3}{11}$  of 24 h. =  $6\frac{6}{11}$  h.  
 $\frac{6}{11}$  h. =  $\frac{6}{11}$  of 60 min. =  $32\frac{6}{11}$  min.  
 $\frac{8}{11}$  min. =  $\frac{8}{11}$  of 60 sec. =  $43\frac{7}{11}$  sec.

Ans. 232 d. 6 h. 32 min.  $43\frac{7}{11}$  sec.

$$94. \frac{7}{9} \text{ mi.} = \frac{7}{9} \text{ of } 320 \text{ rd.} = 248\frac{8}{9} \text{ rd.}$$

$$\frac{8}{9} \text{ rd.} = \frac{8}{9} \text{ of } 5\frac{1}{2} \text{ yd.} = 4\frac{8}{9} \text{ yd.}$$

$$\frac{8}{9} \text{ yd.} = \frac{8}{9} \text{ of } 3 \text{ ft.} = 2\frac{8}{9} \text{ ft.}$$

$$\frac{8}{9} \text{ ft.} = \frac{2}{3} \text{ of } 12 \text{ in.} = 8 \text{ in.}$$

Ans. 248 rd. 4 yd. 2 ft. 8 in.

$$95. .6725 \text{ cental} = .6725 \text{ of } 100 \text{ lb.} = 67.25 \text{ lb.}$$

$$.25 \text{ lb.} = .25 \text{ of } 16 \text{ oz.} = 4 \text{ oz.}$$

Ans. 67 lb. 4 oz.

$$96. .282 \text{ T.} = .282 \text{ of } 20 \text{ cwt.} = 5.64 \text{ cwt.}$$

$$.64 \text{ cwt.} = .64 \text{ of } 100 \text{ lb.} = 64 \text{ lb.}$$

Ans. 5 cwt. 64 lb.

$$97. .875 \text{ rd.} = .875 \text{ of } 5\frac{1}{2} \text{ yd.} = 4.8125 \text{ yd.}$$

$$.8125 \text{ yd.} = .8125 \text{ of } 3 \text{ ft.} = 2.4375 \text{ ft.}$$

$$.4375 \text{ ft.} = .4375 \text{ of } 12 \text{ in.} = 5.25 \text{ in.}$$

Ans. 4 yd. 2 ft. 5.25 in.

$$98. .761 \text{ d.} = .761 \text{ of } 24 \text{ h.} = 18.264 \text{ h.}$$

$$.264 \text{ h.} = .264 \text{ of } 60 \text{ min.} = 15.84 \text{ min.}$$

$$.84 \text{ min.} = .84 \text{ of } 60 \text{ sec.} = 50.4 \text{ sec.}$$

Ans. 18 h. 15 min. 50.4 sec.

$$107. 10 \text{ in.} = 10 \div 12 = \frac{5}{6} \text{ ft.}$$

$$1\frac{1}{2} \text{ ft.} = \frac{11}{6} \div 16\frac{1}{2} = \frac{1}{9} \text{ rd.}$$

$$71\frac{1}{2} \text{ rd.} = \frac{640}{9} \div 320 = \frac{2}{9} \text{ mi., Ans.}$$

$$\begin{aligned}
 109. \quad 8.94 \text{ in.} &= 8.94 \div 12 = .745 \text{ ft.} \\
 2.745 \text{ ft.} &= 2.745 \div 3 = .915 \text{ yd.} \\
 2.915 \text{ yd.} &= 2.915 \div 5\frac{1}{2} = .53 \text{ rd., Ans.}
 \end{aligned}$$

**Article 193.**

$$\begin{aligned}
 110. \quad 155 \text{ sq. ft.} &= 155 \div 272\frac{1}{2} = \frac{620}{1089} \text{ sq. rd.} \\
 68\frac{820}{1089} \text{ sq. rd.} &= 68\frac{820}{1089} \div 160 = \frac{4667}{10890} \text{ A., Ans.}
 \end{aligned}$$

$$\begin{aligned}
 111. \quad 8 \text{ gr.} &= 8 \div 24 = \frac{1}{3} \text{ pwt.} \\
 13\frac{1}{3} \text{ pwt.} &= \frac{40}{3} \div 20 = \frac{2}{3} \text{ oz.} \\
 10\frac{2}{3} \text{ oz.} &= \frac{32}{3} \div 12 = \frac{8}{9} \text{ lb., Ans.}
 \end{aligned}$$

$$\begin{aligned}
 112. \quad 21 \text{ min.} &= 21 \div 60 = \frac{7}{20} \text{ h.} \\
 10\frac{7}{20} \text{ h.} &= 10\frac{7}{20} \div 24 = \frac{207}{480} \text{ d.} \\
 232\frac{227}{480} \text{ d.} &= \frac{111567}{480} \div 365 = \frac{37189}{58400} \text{ y., Ans.}
 \end{aligned}$$

$$\begin{aligned}
 113. \quad 8 \text{ in.} &= 8 \div 12 = \frac{2}{3} \text{ ft.} \\
 2\frac{2}{3} \text{ ft.} &= \frac{8}{3} \div 3 = \frac{8}{9} \text{ yd.} \\
 4\frac{4}{9} \text{ yd.} &= \frac{44}{9} \div 5\frac{1}{2} = \frac{8}{9} \text{ rd.} \\
 248\frac{8}{9} \text{ rd.} &= \frac{2240}{9} \div 320 = \frac{7}{9} \text{ mi., Ans.}
 \end{aligned}$$

114.  $4 \text{ oz.} = 4 \div 16 = .25 \text{ lb.}$   
 $67.25 = 67.25 \div 100 = .6725 \text{ cental, Ans.}$
115.  $64 \text{ lb.} = 64 \div 100 = .64 \text{ cwt.}$   
 $5.64 \text{ cwt.} = 5.64 \div 20 = .282 \text{ T., Ans.}$
116.  $5.25 \text{ in.} = 5.25 \div 12 = .4375 \text{ ft.}$   
 $2.4375 \text{ ft.} = 2.4375 \div 3 = .8125 \text{ yd.}$   
 $4.8125 \text{ yd.} = 4.8125 \div 5\frac{1}{2} = .875 \text{ rd., Ans.}$
117.  $50.4 \text{ sec.} = 50.4 \div 60 = .84 \text{ min.}$   
 $15.84 \text{ min.} = 15.84 \div 60 = .264 \text{ h.}$   
 $18.264 \text{ h.} = 18.264 \div 24 = .761 \text{ d., Ans.}$

**Article 194.**

118.  $2 \text{ A. } 112 \text{ sq. rd.} = 432 \text{ sq. rd.}$      $\frac{144}{432} = \frac{1}{3}, \text{ Ans.}$   
 $144 \text{ sq. rd.} = 144 \text{ sq. rd.}$
119.  $3 \text{ mi. } 120 \text{ rd. } 4 \text{ yd.} = 5944 \text{ yd.}$      $\frac{4183}{5944}, \text{ Ans.}$   
 $2 \text{ mi. } 120 \text{ rd. } 3 \text{ yd.} = 4183 \text{ yd.}$

**120.**

- $1 \text{ lb. } 4 \text{ oz. } 12 \text{ pwt. } 12 \text{ gr.} = 7980 \text{ gr.}$   
 $5 \text{ oz. } 10 \text{ pwt.} = 2640 \text{ gr.}$
- $\frac{2640}{7980} = \frac{44}{133}, \text{ Ans.}$

**121.**

- $74 \text{ mi. } 80 \text{ rd.} = 23760 \text{ rd.}$   
 $9 \text{ mi. } 90 \text{ rd.} = 2970 \text{ rd.}$
- $\frac{2970}{23760} = \frac{1}{8} = .125, \text{ Ans.}$
122.  $7 \text{ bu. } 1 \text{ pk. } 5 \text{ qt.} = 237 \text{ qt.}$   
 $82 \text{ bu. } 3 \text{ pk. } 1 \text{ qt.} = 2649 \text{ qt.}$
- $\frac{2649}{237} = \frac{883}{79} = 11.1747, \text{ Ans.}$



**Article 195.****126.**

63 cu. yd. 11 cu. ft. 842 cu. in.

**128.**

77 d. 8 h. 26 min. 56 sec.

**127.** 199 gal. 1 qt.**129.**  $64^{\circ} 28' 32''$ .**131.** $\frac{7}{11}$  T. = 12 cwt.  $72\frac{8}{11}$  lb. $\frac{1}{2}$  ctl. =  $77\frac{3}{11}$ 

1 T. 2 3

Ans. 1 T. 15 cwt. 53 lb.

**132.** $60\frac{3}{4}$  mi. = 60 mi. 240 rd.

50 120

 $56\frac{1}{2}$  mi. = 56 200

Ans. 167 mi. 240 rd.

**133.**  $\frac{4}{3}$  A. =  $114\frac{2}{3}$  sq. rd. $\frac{3}{4}$  A. =  $106\frac{3}{4}$  $\frac{1}{4}$  A. =  $148\frac{1}{4}$ Ans. 2 A.  $49\frac{1}{4}$  sq. rd.**135.** 73 bu. 2 pk. 5 qt.

59 3 7

Ans. 13 bu. 2 pk. 6 qt.

**136.** 17 mi. 311 rd. 1 yd. 1 ft. 3 in.

3 79 1 2 7

Ans. 14 mi. 231 rd.  $4\frac{1}{2}$  yd. 1 ft. 8 in.

Or,

14 mi. 231 rd. 5 yd. 0 ft. 2 in.

**137.**

116 A. 53 sq. rd. 100 sq. ft. 113 sq. in.

87 137 100 113

Ans. 28 A. 76 sq. rd. 0 sq. ft. 0 sq. in.

**138.** $87^{\circ} 35' 0''$ 

71 4 9

Ans.  $16^{\circ} 30' 51''$ **139.** $\frac{1}{16}$  lb. = 7 oz. 6 pwt. 16 gr.

2 0 19.2

Ans. 5 oz. 5 pwt. 20.8 gr.

**140.**

1 hhd. = 63 gal. 0 qt. 0 pt. 0 gi.

 $\frac{1}{2}$  hhd. = 50 1 1  $0\frac{1}{2}$ Ans. 12 gal. 2 qt. 0 pt.  $3\frac{1}{2}$  gi.

$$\begin{array}{rcl}
 141. & .367 \text{ y.} & = 133 \text{ d. } 22 \text{ h. } 55 \text{ min. } 12 \text{ sec.} \\
 & .761 \text{ d.} & = \begin{array}{r} 18 \quad 15 \quad 50.4 \\ \hline \end{array} \\
 & \text{Ans.} & \overline{133 \text{ d. } 4 \text{ h. } 39 \text{ min. } 21.6 \text{ sec.}}
 \end{array}$$

$$\begin{array}{rcl}
 142. & .7895 \text{ mi.} & = 252 \text{ rd. } 3 \text{ yd. } 1 \text{ ft. } 6.72 \text{ in.} \\
 & \frac{3}{4} \text{ mi.} & = \begin{array}{r} 71 \quad 0 \quad 1 \quad 10 \\ \hline \end{array} \\
 & \text{Ans.} & \overline{181 \text{ rd. } 2 \text{ yd. } 2 \text{ ft. } 8.72 \text{ in.}}
 \end{array}$$

**Article 196.**

$$\begin{array}{rcl}
 144. & \text{Oct. 16, 1876, to Oct. 16, 1881,} & = 5 \text{ y.} \\
 & \text{Oct. 16, 1881, to July 16, 1882,} & = 9 \text{ mo.} \\
 & \text{July 16, 1882, to Aug. 9, 1882,} & = \begin{array}{r} 24 \text{ d.} \\ \hline \end{array} \\
 & \text{Oct. 16, 1876, to Aug. 9, 1882,} & = 5 \text{ y. } 9 \text{ mo. } 24 \text{ d., Ans.}
 \end{array}$$

$$\begin{array}{rcl}
 145. & \text{Nov. 15, 1879, to Nov. 15, 1880,} & = 1 \text{ y.} \\
 & \text{Nov. 15, 1880, to June 15, 1881,} & = 7 \text{ mo.} \\
 & \text{June 15, 1881, to July 5, 1881,} & = \begin{array}{r} 20 \text{ d.} \\ \hline \end{array} \\
 & \text{Nov. 15, 1879, to July 5, 1881,} & = 1 \text{ y. } 7 \text{ mo. } 20 \text{ d., Ans.}
 \end{array}$$

$$\begin{array}{rcl}
 146. & \text{Oct. 19, 1781, to Oct. 19, 1814,} & = 33 \text{ y.} \\
 & \text{Oct. 19, 1814, to Dec. 19, 1814,} & = 2 \text{ mo.} \\
 & \text{Dec. 19, 1814, to Jan. 8, 1815,} & = \begin{array}{r} 20 \text{ d.} \\ \hline \end{array} \\
 & \text{Oct. 19, 1781, to Jan. 8, 1815,} & = 33 \text{ y. } 2 \text{ mo. } 20 \text{ d., Ans.}
 \end{array}$$

$$\begin{array}{rcl}
 147. & \text{July 4, 1776, to July 4, 1862,} & = 86 \text{ y.} \\
 & \text{July 4, 1862, to Dec. 4, 1862,} & = 5 \text{ mo.} \\
 & \text{Dec. 4, 1862, to Jan. 1, 1863,} & = \begin{array}{r} 28 \text{ d.} \\ \hline \end{array} \\
 & \text{July 4, 1776, to Jan. 1, 1863,} & = 86 \text{ y. } 5 \text{ mo. } 28 \text{ d., Ans.}
 \end{array}$$

149. April = 21 days.

May = 31

June = 8

Ans.  $\overline{60}$  days.

152. 141 wk. 4 d. 22 h. 16 min.

153. 37 mi. 170 rd. 1 yd.

154. 10 T. 8 cwt. 53 lb.

155. 355 A. 49 sq. rd.  $21\frac{3}{4}$  sq. yd.156.  $263^{\circ} 51' 40''$ .

158. 17 wk. 3 d. 10 h. 17 min.

159. 3 mi. 124 rd. 1 yd.  $1\frac{1}{2}$  ft.

160. 3 oz. 17 pwt. 14 gr.

161.  $13^{\circ} 10' 35''$ .

162. 61 gal. 1 qt. 1 pt.

150. May = 5 d. 2 h.

June = 30

July = 31

Aug. = 31

Sept. = 30

Oct. = 31

Nov. = 30

Dec. = 31

Jan. = 31

Feb. = 28

Mar. = 4 9

Ans.  $\overline{282}$  d. 11 h.

## MISCELLANEOUS EXERCISES.

163. 18 rd. 5 yd. 2 ft. 11 in.

 $5\frac{1}{2}$  $\overline{104}$  yd.

3

 $\overline{314}$  ft.

12

 $\overline{628}$ 

314

11

Ans.  $\overline{3779}$  in.

164. 5 T. 17 cwt. 25 lb.

20

 $\overline{117}$  cwt.

100

 $\overline{11725}$  lb.

\$ 0.03

 $\overline{\$ 351.75}$ , Ans.

166. 1 common year = 365 d.

1 day =  $\frac{1}{365}$  year.

$$\frac{8}{27} \text{ d.} = \frac{8}{27} \times \frac{1}{365} \text{ y.} = \frac{8}{9855}, \text{ Ans.}$$

165. \$ 0.03 ) \$ 396.18

100 ) 132 06 lb.

20 ) 1 32 cwt. 6 lb.

6 T. 12 cwt.

Ans. 6 T. 12 cwt. 6 lb.

167. 50 T. 5 ctl. 75 lb.

47 17 35

Ans.  $\overline{98}$  T. 3 ctl. 10 lb.

168. 1 mi. = 1760 yd. ; 2 mi. =  $2 \times 1760 = 3520$  yd. ;  
 $3520 \div 55 = 64$ . It gains 5 ft. in 55 yd. ; in 3520 yd., or 64  
 times 55 yd., it will gain 64 times 5 ft., or 320 ft. =

19 rd. 6 ft. 6 in., Ans.

169. 2 A. 65 sq. rd.

$8\frac{1}{2}$

Ans.  $19\text{ A. }136\frac{1}{2}\text{ sq. rd.}$ , or  $19\text{ A. }136\text{ sq. rd. }68\text{ sq. ft. }9\text{ sq. in.}$

170. June 11, 1879, to June 11, 1880, = 366 d.

June 11, 1881, to June 11, 1881, = 365

June 11, 1881, to Aug. 5, 1881, = 55

June 11, 1879, to Aug. 5, 1881, =  $786$  d. Ans.

171. 9 ) 21 T. 537 lb.

Ans. 2 T.  $726\frac{1}{3}$  lb.

172. 47 ) 13267583

60 ) 282289 min.

24 ) 4704 h. 49 min.

196 d.

Ans. 196 d. 0 h. 49 min.

173. 7 A. 148 sq. rd.

160

$\overline{1120}$

148

$\overline{1268}$  sq. rd.

1 A. = 160 sq. rd.

20 A. =  $20 \times 160$  sq. rd. = 3200 sq. rd.

$\frac{1268}{3200} = \frac{317}{800} = .39625$ , Ans.

174. 12 ) 24 cd. 102 cu. ft.

2 cd.  $8\frac{1}{2}$  cu. ft.

128

$\overline{256}$

$8\frac{1}{2}$

16 )  $264\frac{1}{2}$  cu. ft.

Ans.  $16\frac{1}{4}$  cd. ft.

175. 2 oz. 10 pwt.

20

$\overline{50}$  pwt.

11 lb. 5 oz. 10 pwt.

12

$\overline{137}$

20

$\overline{2750}$  pwt.

50 ) 2750

Ans. 55 spoons.

$$\begin{array}{r}
 176. \text{ 19 quires @ } 12\text{¢ sell for} \dots\dots\dots \$ 2.28 \\
 \quad 1 \text{ outside quire sells for} \dots\dots\dots 0.08 \\
 \hline
 20 \text{ quires, or 1 ream, sells for} \dots\dots\dots \$ 2.36 \\
 \quad \text{Cost of 1 ream} \dots\dots\dots 1.75 \\
 \quad \text{Gain on 1 ream} \dots\dots\dots \$ 0.61
 \end{array}$$

$$\text{Gain on 25 reams} = 25 \times \$ 0.61 = \$ 15.25, \text{ Ans.}$$

$$\begin{array}{rcl}
 177. \text{ Mar. 15, 1767, to Mar. 15, 1845,} & = & 78 \text{ y.} \\
 \text{Mar. 15, 1845, to May 15, 1845,} & = & 2 \text{ mo.} \\
 \text{May 15, 1845, to June 8, 1845,} & = & 24 \text{ d.} \\
 \text{Mar. 15, 1767, to June 8, 1845,} & = & 78 \text{ y. } 2 \text{ mo. } 24 \text{ d., Ans.}
 \end{array}$$

$$178. \quad \frac{8}{8} - \frac{3}{8} = \frac{5}{8}, \text{ remaining; } \frac{5}{8} \text{ of } 68\frac{1}{2} = \frac{5}{8} \text{ of } \frac{137}{2} = 42\frac{1}{2}$$

\$ 0.72	\$ 0.90	
68½	42½	
576	180	
432	360	\$ 49.32, bought for.
36	72½	38.52½, sold for.
\$ 49.32	\$ 38.53½	Ans. \$ 10.78¾, loss.

179. Since five cents is the same fractional part of 1 dollar as a cental is of 1 ton, any article is worth as many five cent pieces as a cental as dollars a ton.

$$\begin{array}{rcl}
 180. \text{ 17 rd. 16 ft. 11 in.} & = & 3569 \text{ in.} \\
 \quad \text{18 rd. 5 in.} & = & 3569 \text{ in.} \\
 \text{17 rd. 5 yd. 1 ft. 11 in.} & = & 3569 \text{ in.} \\
 \text{Hence they did not differ.}
 \end{array}$$

181. The time from  $\frac{1}{2}$  before 6 to  $\frac{3}{4}$  past 7 = 2 hours. Hence A would gain 2 hours in 1 day.

Between March 5, 1882, and March 5, 1900, there are 18 years, 14 of which are common years and 4 leap years.

$$14 \text{ com. years} = 14 \times 365 \text{ d.} = 5110 \text{ d.}$$

$$4 \text{ leap years} = 4 \times 366 \text{ d.} = 1464$$

$$\hline 6574 \text{ d.}$$

$$6574 \times 2 \text{ h.} = 13148 \text{ h.} = 547 \text{ d. } 20 \text{ h., Ans.}$$

### Article 213.

$$\begin{array}{rcl} 25. \quad 1365^{\text{mm}} & = & 1.365^{\text{m}} \\ 497^{\text{cm}} & = & 4.97 \\ 145.51^{\text{m}} & = & 145.51 \\ \text{Ans. } 151.845 & \text{meters.} & \end{array}$$

$$\begin{array}{rcl} 26. \quad 15.16^{\text{Ha}} & = & 1516^{\text{a}} \\ 111.55^{\text{a}} & = & 111.55 \\ 3615^{\text{m}} & = & 36.15 \\ \text{Ans. } 1663.70 & \text{ares.} & \end{array}$$

$$\begin{array}{rcl} 27. \quad 45.0^{\text{st}} & & \\ 276^{\text{dst}} & = & 27.6 \\ \hline 17.4^{\text{st}} & \text{Ans.} & \end{array}$$

$$\begin{array}{rcl} 28. \quad 3.40^{\text{mi}} & & \\ 6 & & \\ \hline 20.40^{\text{mi}} & = & 2040^{\text{l}}, \text{ Ans.} \end{array}$$

$$\begin{array}{rcl} 29. \quad 21.080^{\text{T}} & = & 21080^{\text{K}} \\ 8 \overline{) 21080^{\text{K}}} & & \\ \underline{2635^{\text{K}}} & & \\ \$ 0.20 & & \\ \hline \$ 527.00, & \text{Ans.} & \end{array}$$

$$\begin{array}{rcl} 30. \quad 8.42^{\text{Ha}} & & \\ 87.25^{\text{a}} & = & 0.8725 \\ \hline 9.2925^{\text{Ha}} & & \\ 365.50^{\text{Ha}} - 9.2925^{\text{Ha}} & = & \\ \hline 356.2075^{\text{Ha}}, & \text{Ans.} & \end{array}$$

$$\begin{array}{rcl} 32. \quad 1 \text{ kilo} & = & 2.2046 \text{ lb.} \\ 55 \text{ kilos} & = & 55 \times 2.2046 \text{ lb.} = \\ & & 121.253 \text{ lb., Ans.} \end{array}$$

$$\begin{array}{rcl} 33. \quad 1^{\text{sq m}} & = & 1.196 \text{ sq. yd.} \\ 306^{\text{sq m}} & = & 306 \times 1.196 \text{ sq. yd.} = \\ & & 365.976 \text{ sq. yd., Ans.} \end{array}$$

$$\begin{array}{rcl} 34. \quad 1^{\text{Ha}} & = & 2.471 \text{ acres.} \\ 450^{\text{Ha}} & = & 450 \times 2.471 \text{ A.} = 1111.95 \text{ A., Ans.} \end{array}$$

35. 1 kilo = 2.2046 lb.

196 lb.  $\div$  2.2046 lb. = 88.9+ kilos, Ans.

36. 1 bushel = 0.3524<sup>hl</sup>

210 bu. =  $210 \times 0.3524^{\text{hl}} =$

74.004<sup>hl</sup>, Ans.

38. 1<sup>hl</sup> = 2.837 bu.

1 bu. cost \$ 0.65

2.837 bu. cost  $2.837 \times \$0.65 =$

\$ 1.845+, Ans.

39. 
$$\begin{array}{r} 8 \overline{) 600.58^{\text{Ha}}} \\ 75.0725^{\text{Ha}} \end{array}$$

1<sup>Ha</sup> = 2.471 A.

$75.0725 \times 2.471 \text{ A.} = 185.504+ \text{A.}$

$185.504 \times \$25 = \$4637.60+, \text{Ans.}$

40. 1 mile = 1.6093<sup>Km</sup>

1607 mi. =  $1607 \times 1.6093^{\text{Km}} =$

2586.145+<sup>Km</sup>, Ans.

41. 
$$\begin{array}{r} 287 \text{ ft. } 6 \text{ in.} \\ 19 \quad 6 \\ \hline 307 \text{ ft. } 0 \text{ in.} \end{array}$$

1 ft. = 30.48<sup>cm</sup>

307 ft. =  $307 \times 30.48^{\text{cm}} =$

9357.36<sup>cm</sup>, or 93.5736<sup>m</sup>, Ans.

42. 1 ft. = 30.48<sup>cm</sup>; 3 ft. or 1 yd. = 91.44<sup>cm</sup> or 0.9144<sup>m</sup>

65 yd. =  $65 \times 0.9144^{\text{m}} = 59.436^{\text{m}}$

$59.436 \times \$1.20 = \$71.32+$ , cost of carpet.

$65 \times \$1.20 = \$78.00$ , what it sold for.

$\$78 - \$71.32 = \$6.68$ , gain, Ans.

43. A cubic meter has the same capacity as a kiloliter.

$40.64^{\text{cu m}} = 40.64^{\text{kl}}; 1^{\text{hl}} = 2.837 \text{ bu.}; 1^{\text{kl}} = 28.37 \text{ bu.}$

$40.64^{\text{kl}} = 40.64 \times 28.37 \text{ bu.} = 1152.956+ \text{bu.}$

$1152.956 \times \$0.80 = \$922.36$ , Ans.

**Article 222.**

6. 46 ft. 3 in. = 46.25 ft.  
 35 ft. 6 in. = 35.5 ft.

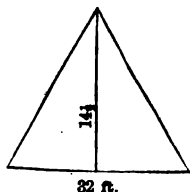
$$\begin{array}{r} 46.25 \\ 35.5 \\ \hline 23125 \\ 23125 \\ \hline 13875 \end{array}$$

2)  $\overline{1641.875}$   
 Ans.  $\overline{820.9375}$  sq. ft., or  
 820 sq. ft. 135 sq. in.

10. 18 ft. = 6 yd.  
 15 ft. 6 in. =  $5\frac{1}{2}$  yd.  
 $6 \times 5\frac{1}{2} = 31$  sq. yd.  
 31 sq. yd.  $\div$  1 yd. = 31 yd., Ans.

12.  $\begin{array}{r} 45 \\ 48 \\ \hline 360 \\ 180 \\ \hline 160 \end{array}$   $\overline{2160}$  sq. rd.  
 Ans.  $13\frac{1}{2}$  A.

13. 1 meter = 39.37 in.  
 39.37 in.  $\div$  12 in. = 3.28 ft.  
 15 meters =  $15 \times 3.28$  ft. = 49.2 ft.  
 $49.2 \times 3.1416 = 154.56+$  ft., Ans.



7. 314.16  
 50  
 2)  $\overline{15708.00}$   
 Ans.  $\overline{7854}$  sq. ft.

8. 3.1416  
 400  
 Ans.  $\overline{1256.6400}$  ft.

9. 3.1416)  $\overline{1256.6400}$   
 Ans. 400 ft.

11.  $\begin{array}{r} 18.75 \\ 18.75 \\ \hline 9375 \\ 13125 \\ 15000 \\ 1875 \end{array}$   
 9)  $\overline{351.5625}$  sq. ft.  
 50)  $\overline{39.0625}$  sq. yd.  
 Ans.  $\overline{.78125}$  yd., or  $28\frac{1}{2}$  in.

14.

$(32 \times 14\frac{1}{2}) \div 2 = \frac{8}{2} \times \frac{29}{2} \times \frac{1}{2} =$   
 232 sq. ft., Ans.



15. 564.50

260

3387000

112900

146770.00 <sup>sq m</sup>

146770.00 <sup>sq m</sup> ÷ 10000 =

14 <sup>ha</sup> 6770 <sup>sq m</sup>, Ans.

16. 288

12.5

1440

576

288

9 ) 3600.0 sq. ft.

400. sq. yd.

.60

\$ 240.00, Ans.

17. 60 ft. = radius of circle.

60 × 2 = 120 ft., diameter.

120 × 3.1416 = 376.992, circumference.

376.992

60

2 ) 22619.520

11309.76 sq. ft. = 41 sq. rd. 147+ sq. ft., Ans.

18. 2.5 ft. × 2.5 ft. = 6.25 sq. ft. in bottom.

2.5 × 6 = 15 sq. ft. in 1 side.

15 × 4 = 60 sq. ft. in 4 sides.

60 sq. ft. + 6.25 sq. ft. = 66.25 sq. ft., Ans.

19. 751

348

6008

3004

2253

272  $\frac{1}{2}$  ) 261348 sq. ft.

4 ) 4

1089 ) 1045392

160 ) 959 sq. rd. 260  $\frac{1}{2}$  sq. ft.

5 A. 159 sq. rd.

Ans. 5 A. 159 sq. rd. 260  $\frac{1}{2}$  sq. ft. 144 ) 167062  $\frac{1}{2}$  sq. in.

1160  $\frac{5}{8}$  sq. ft.

\$ 0.20

9 ) 1160  $\frac{5}{8}$  sq. ft.

128  $\frac{3}{8}$  sq. yd.

\$ 232.03  $\frac{1}{8}$ , cost, Ans.

**Article 223.**

25.  $2\frac{1}{2}$  ft. =  $\frac{4}{2}$  ft., 18 in. =  $\frac{3}{2}$  ft.;  $\frac{5}{2} \times \frac{3}{2} \times 4 = 15$  cu. ft., Ans.

26. 10 ft. 6 in. =  $2\frac{1}{2}$  ft.;  $\frac{21}{2} \times \frac{21}{2} \times \frac{21}{2} = \frac{9261}{8} =$   
1157  $\frac{5}{8}$  cu. ft., Ans.

27.  $13\frac{3}{8} \times 6 = 80\frac{1}{4}$  sq. ft.;  $294\frac{1}{4} \div 80\frac{1}{4} = \frac{1177}{4} \times \frac{4}{321} =$   
 $3\frac{2}{3}$  ft., Ans.

28. 15 decimeters =  $1\frac{1}{2}$  meters;  $\frac{3}{2} \times 1 \times 2 = 3$  cu. meters, Ans.

29.

$$\begin{array}{r} 42 \\ 60 \\ \hline 2520 \\ 8\frac{1}{2} \\ \hline 20160 \\ 1260 \end{array}$$

27 )  $\overline{21420}$  cu. ft.  
Ans.  $793\frac{1}{3}$  cu. yd.

30.

$$\begin{array}{r} 1.45 \\ 3 \\ \hline 4.35 \\ 2 \end{array}$$

Ans.  $\overline{8.700}$  cu. meters.

31. 32 ft. =  $10\frac{2}{3}$  yd.; 3 ft. = 1 yd.

1 yd.  $\times 3.1416 = 3.1416$  yd., circumference.

$\frac{1}{2}$  yd. = radius;  $3.1416 \times \frac{1}{2} \div 2 = .7854$  sq. yd., area  
of base;  $.7854 \times 10\frac{2}{3} = 8.3776$  cu. yd., Ans.

32. 4 ft. 6 in. =  $4\frac{1}{2}$  ft.; 6 ft. 4 in. =  $6\frac{1}{3}$  ft.

$4\frac{1}{2} = \frac{9}{2}$ ,  $6\frac{1}{3} = \frac{19}{3}$ ;  $\frac{9}{2} \times \frac{19}{3} \times \frac{6}{3} = 1026$  sq. ft., Ans.

**Article 227.**

$$33. 32 \times 8 \times 4 = 1024 \text{ cu. ft.}; 1024 \div 128 = 8 \text{ cd., Ans.}$$

$$34. 4 \times 4 \times 64 = 1024 \text{ cu. ft.}; 1024 \div 128 = 8 \text{ cd., Ans.}$$

$$35. 28 \times 4 \times 6\frac{1}{2} = 728 \text{ cu. ft.}; 728 \div 128 = 5\frac{1}{2} \text{ cd., Ans.}$$

$$36. 4 \times 56 = 224; 10 \text{ cd.} \times 128 = 1280 \text{ cu. ft.}$$

$$1280 \div 224 = 5\frac{5}{7} \text{ ft., Ans.}$$

$$37. 3 \text{ ft. } 6 \text{ in.} = 3\frac{1}{2} \text{ ft., } 4 \text{ ft. } 6 \text{ in.} = 4\frac{1}{2} \text{ ft.}$$

$$\frac{7}{2} \times \frac{9}{2} \times 4 \times 2 = 126 \text{ cu. ft.}; 126 \div 128 = \frac{63}{64} \text{ cd., Ans.}$$

$$38. 30 \times 16 \times 12 = 5760 \text{ cu. ft.}; 5760 \div 128 = 45 \text{ cd.}$$

$$\$5.25 \times 45 = \$236.25, \text{ Ans.}$$

**Article 230.**

$$40. 1 \text{ ft. } 6 \text{ in.} = \frac{3}{2} \text{ ft.}; 16 \times \frac{3}{2} = 24 \text{ bd. ft., Ans.}$$

$$41. 16 \text{ in.} = \frac{4}{3} \text{ ft.}; 20 \times \frac{4}{3} \times \frac{5}{2} = 66\frac{2}{3} \text{ bd. ft., Ans.}$$

$$42. 18 + 16 = 34; \frac{34}{2} = 17 \text{ in.} = \frac{17}{12} \text{ ft.}; 20 \times 10 \times \frac{17}{12} =$$

$$283\frac{1}{3} \text{ bd. ft., Ans.}$$

$$43. 9 \text{ in.} = \frac{3}{4} \text{ ft.}; 44 \times 18 \times 3 \times \frac{3}{4} = 1782 \text{ bd. ft.}$$

$$\frac{1782 \times \$23}{1000} = \$40.986, \text{ Ans.}$$

$$44. \quad 21 \text{ in.} = \frac{7}{4} \text{ ft.}; 18 \times \frac{6}{4} \times 2 \times \frac{7}{4} = 1512 \text{ bd. ft.}$$

$$\frac{1512 \times \$35}{1000} = \$52.92, \text{ Ans.}$$

## MISCELLANEOUS EXERCISES.

$$45. \quad 9432 \div 131 = 72 \text{ ft., Ans.}$$

$$46. \quad \frac{4}{8} \times 3 \times \frac{11}{2} = 1\frac{1}{2} \text{ cu. ft.}; 132 \div 128 = 1\frac{1}{32} \text{ cd.}$$

$$\$5.50 \times 1\frac{1}{32} = \$5.67+, \text{ Ans.}$$

$$47. \quad 30 \text{ ft. 6 in.} = \frac{61}{2} \text{ ft.}; 20 \times \frac{61}{2} \times \frac{1}{2} = 1220 \text{ bd. ft., Ans.}$$

$$48. \quad 28 + 20 = 48 \text{ in.}; \frac{1}{2} \text{ of } 48 \text{ in.} = 24 \text{ in., or } 2 \text{ ft.}$$

$$6 \times 16 \times 2 = 192 \text{ bd. ft.}; \frac{192 \times \$40}{1000} = \$7.68, \text{ Ans.}$$

$$49. \quad 90^{\text{cm}} = 0.9^{\text{m}}; 110^{\text{cm}} = 1.1^{\text{m}}; 2.50 \times 0.9 \times 1.1 = 2.475^{\text{cu m}};$$

$$2.475^{\text{cu m}} = 2.475^{\text{kl}} = 24.75^{\text{hl}}, \text{ Ans.}$$

$$50. \quad 18 \times 9 \times 2 = 324 \text{ sq. ft. in sides.}$$

$$12 \times 9 \times 2 = 216 \text{ sq. ft. in ends.}$$

$$\frac{540}{2} \text{ sq. ft. in walls.}$$

$$1 \text{ ft. 8 in.} = \frac{5}{3} \text{ ft.}; 12 \text{ yd.} = 36 \text{ ft.}$$

$$\frac{12}{88} \times \frac{5}{8} = 60 \text{ sq. ft. in 1 roll of paper.}$$

$$540 \div 60 = 9 \text{ rolls, Ans.}$$

51.

$$4 \times 3 \times 4 = 48$$

$$\text{Ans. } \frac{.8}{38.4} \text{ bu.}$$

52.

$$2 \text{ ft. 6 in.} = \frac{5}{8} \text{ ft.}; 1 \text{ ft. 9 in.} = \frac{7}{8} \text{ ft.}$$

$$\frac{5}{8} \times \frac{7}{4} \times 2 = 8\frac{3}{4} \text{ cu. ft.}$$

$$8\frac{3}{4} \times 7\frac{1}{2} = \frac{35}{4} \times \frac{15}{2} = \frac{525}{8} = 65\frac{5}{8} \text{ gal., Ans.}$$

$$53. 12 \text{ ft. 6 in.} = 12\frac{1}{2} \text{ ft.}; 40 \times 12\frac{1}{2} = 500 \text{ sq. ft.}$$

$$8\frac{1}{2} \text{ in.} \times 2 = 17; 500 \times 17 = 8500 \text{ bricks, Ans.}$$

$$54. 8 \times 5 \times 4 = 160 \text{ cu. ft.}; 1 \text{ ton of Lehigh fills } 40 \text{ cu. ft.}$$

$$160 \div 40 = 4 \text{ tons of Lehigh}; 1 \text{ ton of Lackawanna fills } 45 \text{ cu. ft.}; 160 \div 45 = 3\frac{4}{9} \text{ tons of Lackawanna.}$$

$$55. 4840 \text{ sq. in.} = \frac{4840}{144} \text{ sq. ft.}; 3\frac{1}{3} \text{ ft.} = \frac{10}{3} \text{ ft.}$$

$$\frac{605}{4840} \times \frac{5}{10} = \frac{3025}{27} = 112\frac{1}{27} \text{ cu. ft.}$$

$$112\frac{1}{27} \times 1000 = 112037\frac{1}{27} \text{ oz.}$$

$$112037\frac{1}{27} \div 16 = 7002\frac{1}{4} \text{ lb., Ans.}$$

$$56. 18 \text{ in.} = 1\frac{1}{2} \text{ ft.}; 33 + 30 = 63; 63 \times 2 = 126 \text{ ft.}$$

$$126 \times 9 = 1134 \text{ sq. ft. in walls.}$$

$$1134 \times 1\frac{1}{2} = 1701 \text{ cu. ft. in walls.}$$

$$\frac{3}{2} \times \frac{3}{2} \times 4 = 9; 9 \times 9 = 81 \text{ cu. ft. in corners.}$$

$$1701 + 81 = 1782 \text{ cu. ft., Ans.}$$

## Article 231.

50.

$$1116 = 2 \times 2 \times 3 \times 3 \times 31$$

$$1364 = 2 \times 2 \times 11 \times 31$$

$$2 \times 2 \times 31 = 124, \text{ greatest com. divisor.}$$

$$2 \times 2 \times 3 \times 3 \times 11 \times 31 = 12276, \text{ least c. m.}$$

$$12276 \div 124 = 99, \text{ Ans.}$$

$$51. \quad .008$$

$$.06$$

$$\{16. \} \overline{) 00.048}$$

$$\text{Ans. } .003$$

$$52. \quad 160 \overline{) 3.00000} \\ .01875, \text{ Ans.}$$

$$53. \quad 7 \overline{) 3.00} \\ .42\bar{4}, \text{ Ans.}$$

$$54. \quad 1 \text{ mi.} = 5280 \text{ ft.} \\ 10 \text{ mi.} = 10 \times 5280 \text{ ft.} = 52800 \text{ ft.}$$

$$52800 \\ 4 \\ 33 \overline{) 211200} \text{ ft.} \\ \text{Ans. } 6400 \text{ rails.}$$

$$55. \quad 3\frac{1}{2} = 4\frac{1}{2}; \quad 28 \div \frac{56}{15} = \cancel{28} \times \frac{15}{\cancel{56}} = \$7\frac{1}{2}, \text{ cost of 1 ton.}$$

$$17.65 \times \$7\frac{1}{2} = \$132.375, \text{ Ans.}$$

$$56. \quad \frac{4}{5} = \text{land}; \quad \frac{3}{5} = \text{house}; \quad \frac{5}{5} + \frac{2}{5} = \frac{7}{5} = \$14000.$$

$$\frac{5}{5} = \$14000 \div \frac{7}{5} = \$10000; \quad \frac{2}{5} \text{ of } \$10000 = \$4000, \text{ Ans.}$$

$$57. \quad 1 \text{ sq. m.} = 640 \text{ A.}; \quad \frac{2}{5} \text{ of } \cancel{640} = 256; \quad \frac{1}{4} \text{ of } \cancel{640} = 160.$$

$$256 + 160 + 100 = 516 \text{ A.}; \quad 640 - 516 = 124 \text{ A., Ans.}$$

$$58. \quad \$570 + \$80 = \$650. \\ \frac{3}{4} = \$650.$$

$$\frac{5}{5} = \frac{\cancel{650}}{\cancel{4}} \times 5 = \$1625 \text{ in bank.}$$

$$\$570 + \$1625 = \$2195, \text{ Ans.}$$

$$59. \quad 10 \text{ mi.} = 52800 \text{ ft.} \\ 320 \text{ ft.}$$

$$300 \\ \hline 620 \\ 2$$

$$\overline{1240} \text{ ft.} ) 52800 \text{ ft.} \\ \text{Ans. } 42\frac{1}{4}.$$

60.

$$144 \overline{) 20000} \text{ sq. in.} \\ 9 \overline{) 138} \text{ sq. ft. } 128 \text{ sq. in.} \\ \hline 15 \text{ sq. yd. } 3 \text{ sq. ft.} \\ \text{Ans. } 15 \text{ sq. yd. } 3 \text{ sq. ft. } 128 \text{ sq. in.}$$

61.

$$28 \times 15 = 420 \text{ sq. ft.} \\ 420 \text{ sq. ft.} = 46\frac{2}{3} \text{ sq. yd.} \\ 46\frac{2}{3} \div \frac{3}{4} = \frac{3}{3} \times \frac{140}{3} \times \frac{4}{3} = \frac{560}{9} = \\ 62\frac{2}{3} \text{ yd., Ans.}$$

62. 1 A. = 43560 sq. ft. ;  $43560 \text{ ft.} \times 1 = 43560 \text{ cu. ft.}$

$43560 \text{ cu. ft.} = 1613\frac{1}{3} \text{ cu. yd., Ans.}$

63.  $8 \text{ in.} \times 4 \text{ in.} = 32 \text{ sq. in.} = \frac{2}{3} \text{ sq. ft.}$

$\frac{1}{4} \text{ mi., or } 1320 \text{ ft.} \times 8 \text{ ft.} = 10560 \text{ sq. ft.}$

$10560 \div \frac{2}{9} = 47520 \text{ bricks, Ans.}$

64.  $8 \times 2 = 16 \text{ sq. in.} = \frac{1}{3} \text{ sq. ft. ; } \frac{1}{4} \text{ mi.} = 1320 \text{ ft.}$

$1320 \times 8 = 10560 \text{ sq. ft. ; } 10560 \div \frac{1}{9} = 95040 \text{ bricks, Ans.}$

65.  $20 \times 20 = 400 \text{ sq. rd. in square.}$

3.1416

20

62.8320, circumference of circle.

10, radius.

2 ) 628.3200

314.16 sq. rd. in circle.

$400 \text{ sq. rd.} - 314.16 = 85.84 \text{ sq. rd., Ans.}$

66.  $\frac{1}{4} \text{ A.} = 10890 \text{ sq. ft.}$

$10890 \times 1 = 10890 \text{ cu. ft.}$

$10890 \times 930 = 10127700 \text{ oz.}$

16 ) 10127700 oz.

2000 ) 632981\frac{1}{4} lb.

Ans.  $316\frac{1}{3}\frac{1}{4} \text{ T.}$

67.  $30 \text{ in.} = \frac{5}{6} \text{ yd. ; } \frac{5}{6} \times 45 = \frac{225}{6} = 37\frac{1}{2} \text{ sq. yd., Ans.}$

68. 1 hektoliter = 26.417 gal. ;  $\$5.00 \times 26.417 = \$132.08\frac{1}{2}$ .

$\$132.08\frac{1}{2} - \$100 = \$32.08\frac{1}{2} \text{ gain, Ans.}$

69.

$200 \div 50 = 4 \text{ lots ; } 5 \times 150 = 750 \text{ ft. ; } 2 \times 200 = 400 \text{ ft.}$

$400 + 750 = 1150 \text{ ft. of fence ; } \$0.16\frac{1}{2} \text{ per rod} = 1\text{¢ per ft.}$

$1150 \times 1\text{¢} = \$11.50, \text{ Ans.}$

70.  $5 \text{ ft.} \times 3.1416 = 15.708 \text{ ft., circumference.}$

$1 \text{ mi.} = 5280 \text{ ft.}; 26 \text{ mi.} = 26 \times 5280 \text{ ft.} = 137280 \text{ ft.}$

$137280 \text{ ft.} \div 15.708 \text{ ft.} = 8739\frac{4}{11}\text{ times, Ans.}$

71.  $12 \times 40 \times 8\frac{1}{2} = 4200 \text{ cu. ft.}; 4200 \div 128 = 32\frac{1}{8} \text{ cd., Ans.}$

72.  $1 \text{ rd. } 8 \text{ ft.} = \frac{4}{3} \text{ ft.}; \frac{2}{3} \text{ rd.} = \frac{2}{3} \text{ ft.}$

$$\frac{49}{2} \times \frac{99}{8} = \frac{4851}{16} = 303\frac{3}{16} \text{ sq. ft., Ans.}$$

73.  $32 \text{ ft. } 8 \text{ in.} = 32\frac{2}{3} \text{ ft.}; 32\frac{2}{3} \times 55 = 1796\frac{2}{3} \text{ sq. ft.}$

$1796\frac{2}{3} \div 8 = 224\frac{1}{12} \text{ ft.} = 74\frac{1}{3} \frac{1}{4} \text{ yd., Ans.}$

74.  $1 \text{ mi.} = 5280 \text{ ft.}; \frac{3}{4} \text{ mi.} = 3960 \text{ ft.}$

$3960 \times 60 = 237600 \text{ sq. ft.}; 1 \text{ A.} = 43560 \text{ sq. ft.}$

$237600 \div 43560 = 5\frac{1}{11} \text{ A., Ans.}$

75.  $(20 + 20) \times 2 = 80 \text{ ft.}; 80 \times 12 = 960 \text{ sq. ft. in walls.}$

$20 \times 20 = 400 \text{ sq. ft. in ceiling}; 960 + 400 = 1360 \text{ sq. ft.}$

$\frac{1}{3} \text{ of } 1360 = 272 \text{ sq. ft.}; 1360 - 272 = 1088 \text{ sq. ft.}$

$1088 \text{ sq. ft.} = 120\frac{2}{3} \text{ sq. yd.}$

$120\frac{2}{3} \times \$0.16\frac{2}{3} = \$20.14\frac{2}{3}, \text{ Ans.}$

76.  $20 \times 20 = 400 \text{ bd. ft.}; \frac{1}{11} = 400 \text{ bd. ft.}$

$\frac{1}{11} = \frac{400}{10} \times 11 = 440 \text{ bd. ft.} \quad \frac{440 \times \$0.35}{1000} = \$15.40, \text{ Ans.}$

77.  $17.28 \div .083\frac{1}{3} = 207.36$

$$\frac{7\frac{1}{2}}{3000} = \frac{15}{2} \times \frac{1}{\cancel{3000}^{200}} = \frac{1}{400} = 0.0025$$

$207.36 \times 0.0025 = 0.5184, \text{ Ans.}$

78.  $1 \text{ day} = 24 \text{ h.}; 3 \text{ P. M.} = 15 \text{ h. from midnight.}$

$\frac{15}{24} = \frac{5}{8} = 0.625, \text{ Ans.}$



79.  $(16 + 14) \times 2 = 60$  ft., perimeter.

$60 \times 8 = 480$  sq. ft. in walls.

$2 \times 3 = 6$  sq. ft. in 1 yd. of paper;  $480 \div 6 =$

80 yards, Ans.

80. 3.15 P.M., Aug. 3, is 33 d. 15 h. 15 min. from the beginning of July 1st.

33 d. 15 h. 15 min.

$\begin{array}{r} 7 \quad 15 \quad 30 \\ \hline \end{array}$

25 d. 23 h. 45 min.

25 d. 23 h. 45 min. from July 1 is July 26, 11.45 P.M., Ans.

81. 3 in.  $= \frac{1}{4}$  ft.;  $\overset{75}{\cancel{300}} \times \frac{1}{4} = 75$  sq. ft.; 75 sq. ft. =

$8\frac{1}{2}$  sq. yd., Ans.

82. 1 pt.  $\div 2 = \frac{1}{2}$  qt.;  $3\frac{1}{2}$  qt.  $= \frac{7}{2} \div 4 = \frac{7}{8}$  gal.

$18\frac{2}{3} \times \$0.45 = \$8.49\frac{2}{3}$ , Ans.

83.

$0.7\frac{3}{8} = \frac{59}{8} \times \frac{1}{10} = \frac{59}{80}$ ;  $\frac{7}{10} + \frac{3}{8} = \frac{86}{80}$ ;  $\frac{86}{80} - \frac{59}{80} = \frac{27}{80}$ , Ans.

84. 1 A. = 160 sq. rd.; 8 rd. sq. = 64 sq. rd.

$64 + 8 = 72$  sq. rd.;  $160 - 72 = 88$  sq. rd., Ans.

85.  $4\frac{1}{2} \times 128$  cu. ft. = 576 cu. ft.; 5 ft. 6 in.  $= \frac{11}{2}$  ft.

$\frac{9}{2} \times \frac{11}{2} = \frac{99}{4}$  sq. ft.;  $576 \div \frac{99}{4} = \overset{64}{\cancel{576}} \times \frac{4}{\underset{11}{\cancel{99}}} = 23\frac{3}{11}$  ft., Ans.

86.  $\overset{20}{\cancel{80}} \times \frac{3}{4} = 60$  sq. yd.;  $60 \times 9 = 540$  sq. ft.

$540 \div 30 = 18$  ft., Ans.

87. 1 A. = 43560 sq. ft. ; 5 A. = 217800 sq. ft.  
 $217800 \div 600 = 363$  ft. wide ;  $(600 + 363)$ , or  $963$ ,  $\times 2 =$   
 1926 ft., Ans.

88. 18 in. =  $\frac{3}{4}$  ft. ; 40 in. =  $1\frac{2}{3}$  ft. ;  $2 \times \frac{3}{4} \times 56 = 168$  sq. ft.  
 $168 \div \frac{10}{3} = 50\frac{2}{3}$  ft. =  $16\frac{2}{3}$  yd., Ans.

89. 1 cu. yd. = 1728 cu. in.  $\times 27 = 46656$  cu. in.  
 1 2-inch cube = 8 cu. in. ;  $46656 \div 8 = 5832$ , Ans.

90. 20 in. =  $1\frac{2}{3}$  ft. ;  $15 \times 1\frac{2}{3} \times 20 = 500$  bd. ft.  
 .05 of 500 = 25 ft. ;  $500$  ft. - 25 ft. = 475 ft., Ans.

91. 90 rd. sq. = 8100 sq. rd. ;  $8100 - 90 = 8010$  sq. rd.  
 $8010 \div 160 = 50\frac{1}{8}$  A. ;  $\$240 \times 50\frac{1}{8} = \$12015$ , Ans.

92.  $9\frac{1}{4} - 3\frac{3}{8} = 5\frac{1}{8}$  ;  $\frac{5\frac{1}{8}}{9\frac{1}{4}} = \frac{194}{35} \times \frac{7}{64} = \frac{97}{160}$ , Ans.

93. 12 rd. = 198 ft. ; 10 rd. = 165 ft.  
 $(198 + 165)$ , or 363,  $\times 2 = 726$  ft. ;  $726 \times 6 = 4356$  sq. ft.  
 $6 \times 6$ , or 36,  $\times 4 = 144$  sq. ft. in corners.  
 $4356 - 144 = 4212$  sq. ft. = 468 sq. yd.  
 $\$0.75 \times 468 = \$351$ , Ans.

94.  $(240 + 160) \times 2 = 800$  ft.  
 $800 \times 6 = 4800$  sq. ft. on 1 side.  
 $4800 \times 2 = 9600$  sq. ft. on 2 sides.  
 $9600$  sq. ft.  $\div 9 = 1066\frac{2}{3}$  sq. yd.  
 $1066\frac{2}{3} \times \$0.05 = \$53.33\frac{1}{3}$ , Ans.

95. Feb. = 24 d. 1 h. 30 min.

Mar. = 31

Apr. = 30

May = 10 3 h. 40 min.

Ans. 95 d. 5 h. 10 min.

96.

$$9 \times \frac{5}{4} \times \frac{225}{900} = 10125 \text{ sq. yd.}; 10125 \div \frac{3}{4} = \frac{3375}{10125} \times \frac{4}{3} = 13500 \text{ yd., Ans.}$$

97.  $30 \times 27 = 810 \text{ sq. ft.}; 810 \div 9 = 90 \text{ sq. yd.}$

$90 \div 1 = 90 \text{ yd.}; 90 \times \$1.25 = \$112.50$

$90 \div \frac{3}{4} = 120 \text{ yd.}; 120 \times \$1 = \$120$

$\$120 - \$112.50 = \$7.50.$  Ans. Yard wide; \$7.50.

98.  $2 \times 1 \times 1.4 = 2.8^{\text{cu m}}; 2.8^{\text{cu m}} = 2.8^{\text{kl}} = 28^{\text{hl}}$

$28 \times 75^{\text{k}} = 2100^{\text{k}} = 2.1^{\text{T}}, \text{ Ans.}$

99.

$112 \times 25 \times 2 = 5600 \text{ sq. ft.}; 5600 \times 10 = 56000 \text{ shingles.}$

$56.000 \times \$6.50 = \$364, \text{ Ans.}$

100.  $\$0.18\frac{1}{4} \times 12 = \$2.25, \text{ Ans.}$

101.  $14\frac{1}{8} \times 5\frac{1}{8} = \frac{119}{8} \times \frac{45}{8} = \$83\frac{1}{4}$

$12\frac{1}{2} \times 6\frac{1}{2} = \frac{51}{4} \times \frac{13}{2} = \$82\frac{1}{8}$

$14\frac{1}{8} + 12\frac{1}{2} = 27\frac{1}{8}; 27\frac{1}{8} \times \$0.25 = \$6\frac{3}{8}$

$\$83\frac{1}{4} + \$82\frac{1}{8} + \$6\frac{3}{8} = \$173\frac{3}{4} = \$173.45\frac{1}{8}, \text{ Ans.}$

$$102. 3\frac{1}{3} \times 4\frac{1}{3} = \frac{10}{3} \times \frac{37}{9} = \frac{370}{27}$$

$$\frac{37}{9} - \frac{10}{3} = \frac{37}{9} - \frac{30}{9} = \frac{7}{9}; \quad \frac{1}{2} \text{ of } \frac{7}{9} = \frac{7}{18}$$

$$\frac{370}{27} - \frac{7}{18} = \frac{740}{54} - \frac{21}{54} = \frac{719}{54} = 13\frac{1}{4}, \text{ Ans.}$$

$$103. 19\frac{3}{8} \div 17\frac{1}{2} = \$\frac{31}{28}; \quad \frac{4}{5} \text{ of } \frac{31}{28} = \$\frac{31}{35} = \$0.88\frac{4}{5}, \text{ Ans.}$$

$$104. 1 \text{ yd. sells for } \$\frac{2}{3}; \quad \frac{1}{2} \text{ yd. sells for } \frac{1}{2} \times \$\frac{2}{3} = \$\frac{1}{3}.$$

$$\$ \frac{2}{3} - \$ \frac{1}{3} = \$ \frac{1}{3}, \text{ cost of } \frac{1}{2} \text{ yd. } \$ \frac{1}{3} \times \frac{2}{3} = \$ \frac{2}{9}, \text{ cost of 1 yd.}$$

$$\frac{2}{3} \text{ of } \$ \frac{2}{9} = \$ \frac{4}{9} = \$0.52\frac{1}{2}, \text{ cost of } \frac{1}{2} \text{ yd., Ans.}$$

**Article 241**

$$35. \$2575 \times .40 = \$1030; \quad \$2575 + \$1030 = \$3605, \text{ Ans.}$$

$$36. \$1890 \times .83\frac{1}{3} = \$1575; \quad \$1890 - \$1575 = \$315, \text{ Ans.}$$

**Article 242.****37.**

$$8500 \times .28 = 2380 \text{ T., Ans.}$$

**38.**

$$6840 \times .03 = 205.20 \text{ gal., Ans.}$$

**39.**

$$2584 \times .00\frac{7}{8} = 22.61 \text{ mi., Ans.}$$

**40.**

$$3460 \times .35 = 1211 \text{ men, Ans.}$$

**41.**

$$\$5000 \times .09\frac{3}{4} = \$487.50, \text{ Ans.}$$

**42.**

$$\$645.50 \times .08 = \$51.64, \text{ Ans.}$$

**43.**

$$\$13.56 \times .06 = \$0.8136, \text{ Ans.}$$

**44.**

$$\$817.68 \times .62\frac{1}{2} = \$511.05, \text{ Ans.}$$

45.  $100\% - 15\% = 85\%$ ;  $\$4850 \times .85 = \$4122.50$ , Ans.

46.  $100\% + 16\% = 116\%$ ;  $\$9675.75 \times 1.16 = \$11223.87$ , Ans.

47.

$\$186.80 \times .05 = \$9.34$ , Ans.

48.

$61450 \times .24 = 14748$ , Ans.

49.

$\$4500 \times 2.85 = \$12825$ , Ans.

50.

$100\% - 33\frac{1}{3}\% = 66\frac{2}{3}\%$

$\$8550 \times .66\frac{2}{3} = \$5700$ , Ans.

51.  $100\% + 15\% = 115\%$ ;  $\$345.75 \times 1.15 = \$397.6125$

$100\% - 15\% = 85\%$ ;  $\$397.6125 \times .85 = \$337.97$ , Ans.

64.  $\frac{57}{600} = \frac{19}{200} = .09\frac{1}{2}$ , or  $9\frac{1}{2}\%$ , Ans.

## Article 243.

65.  $\frac{18275}{215000} = \frac{731}{8600} = .08\frac{1}{2}$ , or  $8\frac{1}{2}\%$ , Ans.

66.  $\frac{8}{130} = \frac{4}{65} = .06\frac{2}{13}$ , or  $6\frac{2}{13}\%$ , Ans.

67.  $\frac{160}{625} = \frac{32}{125} = .25\frac{3}{4}$ , or  $25\frac{3}{4}\%$ , Ans.

68.  $\frac{490}{5000} = \frac{49}{500} = .09\frac{1}{2}$ , or  $9\frac{1}{2}\%$ , Ans.

69.  $\frac{600}{720} = \frac{5}{6} = .83\frac{1}{3}$ , or  $83\frac{1}{3}\%$ , Ans.

70.  $\frac{70}{500} = \frac{7}{50} = .14$ , or  $14\%$ , Ans.

$$71. \frac{85}{1700} = \frac{1}{20} = .05, \text{ or } 5\%, \text{ Ans.}$$

$$72. \frac{57375}{765000} = \frac{51}{680} = .07\frac{1}{2}, \text{ or } 7\frac{1}{2}\%, \text{ Ans.}$$

$$73. \frac{246}{1640} = \frac{123}{820} = .15, \text{ or } 15\%, \text{ Ans.}$$

$$74. \frac{16825}{134600} = \frac{673}{5384} = .12\frac{1}{2}, \text{ or } 12\frac{1}{2}\%, \text{ Ans.}$$

$$82. \frac{\$16.22}{\cancel{5}} \times \overset{20}{100} = \$324.40, \text{ Ans.}$$

$$83. 100\% - 40\% = 60\%; \frac{\overset{59}{177}}{\cancel{60}} \times \overset{5}{100} = 295 \text{ sheep, Ans.}$$

**Article 244.**

$$84. \frac{\$125}{\underset{2}{\cancel{8}}} \times \overset{25}{100} = \$1562.50, \text{ Ans.} \quad 85. \frac{.108}{.75} \times 100 = 14.4 \text{ tons, Ans.}$$

$$86. \frac{\overset{2}{16}}{\underset{3}{24}} \times 100 = 66\frac{2}{3} \text{ bu., Ans.} \quad 87. \frac{7.80}{.75} \times 100 = 1040 \text{ yd., Ans.}$$

$$88. \frac{21.6}{.66\frac{2}{3}} = 32.4; 32.4 \times 100 = 3240 \text{ rd., Ans.}$$

$$89. \frac{\$14}{.4} = \$35; \$35 \times 100 = \$3500, \text{ Ans.}$$

$$90. \frac{1750}{25} \times 100 = 7000 \text{ lb., Ans.}$$

$$91. 100\% - 40\% = 60\%; \frac{250}{60} \times 100 = \$416\frac{2}{3}.$$

$$\$416\frac{2}{3} - \$250 = \$166\frac{2}{3}, \text{ Ans.}$$

92.

$$100\% - 33\frac{1}{3}\% = 66\frac{2}{3}\%; \frac{\$1600}{66\frac{2}{3}} \times 100 = \$2400, \text{ Ans.}$$

$$93. \frac{\$2250}{75} \times 100 = \$3000, \text{ Ans.}$$

$$94. 100\% + 20\% = 120\%; \frac{16386}{120} \times 100 = 13655, \text{ Ans.}$$

**Article 246.**

102.

$$\$7.75 \times .20 = \$1.55, \text{ Ans.}$$

103.

$$\$18240 \times .66\frac{2}{3} = \$12160, \text{ Ans.}$$

104.

$$\$400 \times .25 = \$100, \text{ loss; } \$400 - \$100 = \$300, \text{ remainder.}$$

$$\$300 \times .16\frac{2}{3} = \$50, \text{ gain; } \$100 - \$50 = \$50, \text{ loss, Ans.}$$

105.

$$\$69.60 \times .15 = \$10.44, \text{ Ans.}$$

106.

$$\$350.50 \times .06\frac{1}{2} = \$22.78\frac{1}{2}, \text{ Ans.}$$

$$107. \$3500 \times 1.08 = \$3780, \text{ Ans.}$$

$$108. 100\% - 16\% = 84\%; \frac{\$210}{\cancel{84}^{10} \cancel{21}^{25}} \times 100 = \$250, \text{ Ans.}$$

109.

$$\$2550 - \$2400 = \$150, \text{ gain}; \frac{75}{\cancel{2400}^{150} \cancel{12}^{24}} \text{ of } 100\% = 6\frac{1}{4}\%, \text{ Ans.}$$

$$110. 12 - 8\frac{1}{2} = 3\frac{1}{2} \text{ cents}; \frac{3\frac{1}{2}}{8\frac{1}{2}} = \frac{7}{17} \text{ of } 100\% = 41\frac{3}{7}\%, \text{ Ans.}$$

$$111. \$3312.70 = 105\frac{1}{2}\%; \frac{\$3312.70}{105\frac{1}{2}} \times 100 = \$3140, \text{ Ans.}$$

$$112. 100\% - 12\frac{1}{2}\% = 87\frac{1}{2}\%; \$560 \times .87\frac{1}{2} = \$490, \text{ Ans.}$$

$$113. \$7.50 \times .06 = \$0.45; \$7.50 + \$0.45 = \$7.95.  
\$7.95 \times 1.05 = \$8.34\frac{3}{4}, \text{ Ans.}$$

$$114. \$1600 \times .20 = \$320; \frac{1}{4} \text{ of } \$1600 = \$400.  
\$400 \times .15 = \$60; \$1600 - \$400 = \$1200.  
\$320 - \$60 = \$260; \$1200 + \$260 = \$1460, \text{ Ans.}$$

115.

$$\$28 = 112\%; \frac{\$28}{\cancel{112}^{28} \cancel{4}^{25}} \times 100 = \$25, \text{ cost}; \$25 - \$24 = \$1, \text{ loss.}$$

$$\frac{1}{25} \text{ of } 100\% = 4\% \text{ loss, Ans.}$$

$$116. \$50 \times 1.10 = \$55; \frac{4}{5} \text{ of } 120 = 96 \text{ gal.}  
\$55 \div 96 = \$0.57\frac{7}{8}, \text{ Ans.}$$



$$117. \$15 = 90\% ; \frac{\$15}{90} \times 100 = \$16\frac{2}{3}, \text{ cost.}$$

$$\$16\frac{2}{3} \times 1.15 = \$19.16\frac{2}{3}, \text{ Ans.}$$

$$118. \$150 = 90\% ; \frac{\$150}{90} \times 100 = \$166\frac{2}{3}, \text{ cost.}$$

$$\$166\frac{2}{3} \times 1.30 = \$216\frac{2}{3} ; \$216\frac{2}{3} - \$150 = \$66\frac{2}{3}, \text{ Ans.}$$

$$119. \$7250 \times .80 = \$5800 ; \$7250 \times 1.20 = \$8700.$$

$$\$5800 + \$8700 = \$14500. \text{ Neither gain nor lose, Ans.}$$

**Article 248.****123.**

$$\$5678 \times .02\frac{1}{2} = \$141.95, \text{ Ans.}$$

**124.**

$$\$3500 \times .00\frac{1}{4} = \$8.75, \text{ Ans.}$$

$$125. \$7896.50 \times .02 = \$157.93, \text{ Ans.}$$

$$126. 368 \times \$6.50 = \$2392 ; \$2392 \times .02\frac{1}{2} = \$59.80, \text{ Ans.}$$

**127.**

$$\$5000 \times .00\frac{1}{4} = \$12.50 ; \$5000 + \$12.50 = \$5012.50, \text{ Ans.}$$

$$128. \$13500 \times .02\frac{1}{2} = \$337.50 ; \$13500 \times .02 = \$270.$$

$$\$337.50 + \$270 + \$16.50 = \$624.$$

$$\$13500 - \$624 = \$12876, \text{ Ans.}$$

**130.**

$$\$650 = 100\% + 3\% = 103\% ; \frac{\$650}{103} \times 100 = \$631.06+.$$

$$\$650 - \$631.06 = \$18.94, \text{ Ans.}$$

**131.**

$$\$1426.80 = 100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\% ; \frac{\$1426.80}{102\frac{1}{2}} \times 100 = \$1392.$$

$$\$1392 \div \$6.50 = 214\frac{2}{5} \text{ bbl, Ans.}$$

132.  $\$1392 \times 1.02\frac{1}{2} = \$1426.80$ , Ans.

133.  $\$334.75 - \$22.75 = \$312$ , commission.

$$\frac{312}{8134.75} = 3.83\% \text{, Ans.}$$

134.

$\$950 \times .65 = \$617.50$ ;  $\$617.50 \times .06\frac{1}{2} = \$38.59$ , Ans.

135.  $\$208.50 \div .05 = \$4170$ , Ans.

136.

$\$4100 = 102\frac{1}{2}\%$ ;  $\frac{\$4100}{102\frac{1}{2}} \times 100 = \$4000$ , for purchase of iron.

$\$4000 \times .02\frac{1}{2} = \$100$ , commission.

$\$4000 - \$100 = \$3900$ , balance.

$\$4100 - \$3900 = \$200$ , loss, Ans.

### Article 252

139.  $\$3600 \times .02 = \$72$ ;  $\$72 + \$1 = \$73$ , Ans.

140.  $\$5545 \times .02\frac{1}{2} = \$124.76$ , Ans.

141.  $\frac{3}{4}$  of  $\$68000 = \$51000$ ;  $\$51000 \times .03 = \$1530$ .

$\$1530 + \$1 = \$1531$ , Ans.

142.

$\$55000 \times .02\frac{1}{2} = \$1375$ ;  $\$55000 - \$1375 = \$53625$ , Ans.

143.  $\$27 \div .01\frac{1}{2} = \$1800$ ;  $\$1800 = \frac{3}{4}$  of the value.

$\$1800 \div \frac{3}{4} = \$2400$ , Ans.

144.  $\$73 - \$1 = \$72$ ;  $\$72 \div \$3600 = .02$ , or 2%, Ans.

145.  $74 - 44 = 30$  years;  $\$26.50 \times 15 = \$397.50$ .

$\$397.50 \times 30 = \$11925$ ;  $\$15000 - \$11925 = \$3075$ , Ans.

## MISCELLANEOUS EXERCISES.

146.  $\frac{1}{8}\% = .00125$

$5\% = .05$

$24\% = .24$

$55\% = .55$

$\frac{.84125}{.84125} = 60.25$

$60.25 \div .84125 = 71\frac{1}{3}, \text{ Ans.}$

147.  $37 + 3 = 40$  parts.

$\frac{37}{40} \text{ of } 100\% = 92\frac{1}{2}\%, \text{ Ans.}$

$\frac{3}{40} \text{ of } 100\% = 7\frac{1}{2}\%, \text{ Ans.}$

148.  $\$275 + \$180 + \$150 = \$605$ ;  $\$950 - \$605 = \$345$ .

$\frac{345}{950} \text{ of } 100\% = 36\frac{1}{3}\%, \text{ Ans.}$

149.

$\frac{150}{2} = \$0.75$ ;  $\frac{150}{3} = \$0.50$ ;  $\$0.75 + \$0.50 = \$1.25$ , cost.

$150 + 150 = 300$ ;  $\frac{60}{5} \times 2 = \$1.20$ , sold for.

$\$1.25 - \$1.20 = \$0.05$ , loss, Ans.

150.  $\$10 \div 12 = \$0.83\frac{1}{3}$ , cost of 1 book.

$\$1.75 - \$0.83\frac{1}{3} = \$0.91\frac{2}{3}$ , gain on 1 book.

$\frac{91\frac{2}{3}}{83\frac{1}{3}} = \frac{11}{10} \text{ of } 100 = 110\%$ , gain, Ans.

151.  $100\% - 25\% = 75\%$ ;  $\$1540 \times .75 = \$1155$ .

$100\% - 5\% = 95\%$ ;  $\$1155 \times .95 = \$1097.25$ , Ans.

152.  $100\% + 5\% = 105\%$ ;  $\$603.75 \div 1.05 = \$575$ .

$\$575 \div \$5 = 115$  barrels, Ans.

153.  $\$17.25 = 15\%$ ;  $\$17.25 \div .15 = \$115$ , Ans.

154.  $100\% - 2\% = 98\%$ ;  $\$25640 \times 0.98 = \$26163.26$ , Ans.

155.  $\$4.25 \times .25 = \$1.06\frac{1}{4}$ ;  $\$4.25 + \$1.06\frac{1}{4} = \$5.31\frac{1}{4}$ , Ans.

156.  $\$5 \times 80 = \$400$ , cost;  $100\% - 10\% = 90\%$ .  
 $80 \times .90 = 72$  tons;  $\$400 \div 72 = \$5\frac{5}{9}$ , Ans.

157.  $4500 \times \$1.20 = \$54200$ , cost.  
 $10\%$  of 4500 bu. = 450 bu.;  $3\%$  of  $\$1.20 = \$0.036$ .  
 $\$1.20 - \$0.036 = \$1.164$ ;  $450 \times \$1.164 = \$523.80$ .  
 $50\%$  of 4500 bu. = 2250 bu.;  $10\%$  of  $\$1.20 = \$0.12$ .  
 $\$120 + \$0.12 = \$1.32$ ;  $2250 \times \$1.32 = \$2970$ .  
 $50\% + 10\% = 60\%$ ;  $100\% - 60\% = 40\%$ .  
 $40\%$  of 4500 bu. = 1800 bu.;  $5\%$  of  $\$1.20 = \$0.06$ .  
 $\$1.20 + \$0.06 = \$1.26$ ;  $1800 \times \$1.26 = \$2268$ .  
 $\$523.80 + \$2970 + \$2268 = \$5761.80$ .  
 $\$5761.80 - \$5400 = \$361.80$ , gain, Ans.

158.  $\$6000 = 66\frac{2}{3}\%$ ;  $\frac{\$6000}{66\frac{2}{3}} \times 100 = \$9000$ , cost.  
 $\$9000 - \$6000 = \$3000$ , loss;  $\$3000 = 32\%$ .

$\frac{\$3000}{\frac{32}{8}} \times \frac{25}{100} = \$9375$ , cost of 2d house.  
 $\$9375 + \$3000 = \$12375$ , Ans.

159.  $\frac{104513}{1652000}$  of  $100\% = 6\frac{4322}{165200}\%$ , Ans.

160.  $\$13195 = 101\frac{1}{2}\%$ ;  $\frac{\$13195}{101\frac{1}{2}} \times 100 = \$13000$ .  
 $\$13195 - \$13000 = \$195$ , Ans.

161.  $\frac{3}{4}$  of  $\$12000 = \$9000$ ;  $\$9000 \times .00\frac{3}{4} = \$33.75$ .  
 $\$12000 - \$9000 = \$3000$ ;  $\$33.75 + \$3000 =$   
 $\$3033.75$ , Ans.

162.  $\$23.25 \div \$930 = .02\frac{1}{2}$ , or  $2\frac{1}{2}\%$ , Ans.

163.  $100\% - 2\frac{1}{2}\% = 97\frac{1}{2}\% = 0.975$ ;  $\$4387.50 \div 0.975 =$   
 $\$4500$ , Ans.

164.  $\$11500 \times .02\frac{1}{2} = \$287.50$ ;  $\$11500 \times .02\frac{1}{2} = \$287.50$ .  
 $\$287.50 + \$287.50 + \$35 + \$17.25 = \$627.25$ .  
 $\$11500 - \$627.25 = \$10872.75$ , Ans.

165.  $\$1400 \times .25 = \$350$ , gain;  $\$1400 \times .90 = \$1260$ .  
 $\$1400 - \$1260 = \$140$ , loss.  
 $\$350 - \$140 = \$210$ , actual gain.  
 $\$1400 - \$350 = \$1050$ , original value.  
 $\$210 \div \$1050 = 20\%$ , actual gain %, Ans.

166.  $100\% - 8\frac{2}{3}\% = 91\frac{1}{3}\%$ ;  $\$920 = 91\frac{1}{3}\%$ .  
 $\frac{\$920}{91\frac{1}{3}} \times 100 = \$1008.77\frac{1}{3}$ , Ans.

167.  $24 \times .50 = 12$  ft.;  $24 \times 12 = 288$  sq. ft.  
 $288$  sq. ft.  $= 32$  sq. yd.;  $32 \div \frac{3}{4} = 42\frac{2}{3}$  yd., Ans.

168.  $100\% - 11\% = 89\%$ ;  $133.5$  bbl.  $= 89\%$ .  
 $133.5$  bbl.  $\div .89 = 150$  bbl., had at first.  
 $150 \times \$2.50 = \$375$ , cost.  
 $\$375 \div 133.5 = \$2.80\frac{8}{9}$ , per bbl., Ans.

169.  $500 \times \$10 = \$5000$ ;  $\$5000 - \$4750 = \$250$ .  
 $\frac{250}{5000} = \frac{1}{20}$  of  $100\%$   $= 5\%$ , Ans.

**170.**  $\$8000 \times .01\frac{1}{2} = \$120$ ;  $\$15000 \times .00\frac{2}{3} = \$90$ .  
 $\$120 + \$90 = \$210$ ;  $\$15000 + \$8000 = \$23000$ .  
 $\$23000 - \$210 = \$22790$ , Ans.

**171.**  $55\% - 24\% = 31\%$ ;  $60.45 = 31\%$ .  
 $60.45 \div .31 = 195$ , Ans.

**172.**  $20 \times 12 \times 4 = 960$  cu. ft., or  $7\frac{1}{2}$  cu.  
 $7\frac{1}{2} \times \$5 = \$37\frac{1}{2}$ ;  $\$50 - \$37\frac{1}{2} = \$12\frac{1}{2}$ .  

$$\frac{12\frac{1}{2}}{37\frac{1}{2}} = \frac{25}{75} \times \frac{2}{3} = \frac{1}{3} \text{ of } 100\% = 33\frac{1}{3}\%, \text{ Ans.}$$

**173.**  $4 \text{ ft.} = 48 \text{ in.}$ ;  $48 \text{ in.} - 44 \text{ in.} = 4 \text{ in.}$   
 $\frac{4}{48}$  or  $\frac{1}{12}$  of  $\$30 = \$2.50$ , Ans.

**174.**  $4 \times 5 \times 2 = 40$  sessions in 4 weeks.  
 $120 \div 40 = 3$ , absent each session.  
 $400 - 3 = 397$ , present each session.

$$\frac{397}{400} \text{ of } 100\% = 99\frac{1}{4}\%, \text{ Ans.}$$

**175.**  $\$2.50 \times .20 = \$0.50$ ;  $\$2.50 + \$0.50 = \$3$ , sold for.  
 $\$3 = 75\%$  of marked price;  $\$3 \div .75 = \$4$ , Ans.

**176.**  $62\frac{3}{4} - 57\frac{1}{2} = 4\frac{1}{2} \text{ lb.}$ ;  $\frac{4\frac{1}{2}}{62\frac{3}{4}} = \frac{39}{499}$  of  $100\% = 7\frac{1}{2}\frac{3}{4}\%$ , Ans.

**177.**  $100\% + 69\% = 169\%$ ;  $503620 = 169\%$ .

$$\frac{503620}{169} \times 100 = 298000, \text{ Ans.}$$

**Article 259.**

12. \$ 1728 = Principal.

.06 = Rate.

$\$ 103.68 = 1 \text{ year's int.}$

$3\frac{3}{4}$

$\underline{31104}$

7776

$\$ 388.80 = \text{Interest.}$

1728.00 = Principal.

Ans.  $\$ 2116.80 = \text{Amount.}$

13. \$ 144 = Principal.

.05 = Rate.

$\$ 7.20 = 1 \text{ year's int.}$

$1\frac{3}{4}$

$\underline{720}$

480

Ans.  $\$ 12.00 = \text{Interest.}$

16. \$ 1500 = Principal.

.06 = Rate.

$\$ 90.00 = 1 \text{ year's interest.}$

$2\frac{1}{2}$

$\underline{18000}$

4875

$\$ 228.75 = \text{Interest.}$

1500.00

Ans.  $\$ 1728.75 = \text{Amount.}$

**Article 260.**

17. \$ 2464 = Principal.

.05 = Rate.

$\$ 123.20 = 1 \text{ year's int.}$

$2\frac{1}{2}$

$\underline{24640}$

9753 $\frac{1}{2}$

Ans.  $\$ 343.93\frac{1}{2} = \text{Interest.}$

18. \$ 2503.75 = Principal.

.06 = Rate.

$\$ 150.2250 = 1 \text{ year's int.}$

$3\frac{1}{2}$

$\underline{4506750}$

1339506

Ans.  $\$ 584.6256 = \text{Interest.}$

19. \$ 560.50 = Principal.

.07 = Rate.

$\$ 39.2350 = 1 \text{ year's int.}$

$\begin{array}{r} 4\frac{1}{32} \\ \hline 1569400 \end{array}$

10898

Ans.  $\$ 158.0298 = \text{Interest.}$

20. \$ 97.16 = Principal.

.06 = Rate.

$\$ 5.8296 = 1 \text{ year's int.}$

$\begin{array}{r} 1\frac{1}{4} \\ \hline 58296 \end{array}$

24290

Ans.  $\$ 8.2586 = \text{Interest.}$

21. \$ 156.80 = Principal.

.04 = Rate.

$\$ 6.2720 = 1 \text{ year's int.}$

$\begin{array}{r} 3\frac{11}{20} \\ \hline 188160 \end{array}$

5749

Ans.  $\$ 19.3909 = \text{Interest.}$

22. \$ 865 = Principal.

.08 = Rate.

$\$ 69.20 = 1 \text{ year's int.}$

$\begin{array}{r} 1\frac{1}{2} \\ \hline 6920 \end{array}$

5651

Ans.  $\$ 125.71 = \text{Interest.}$

23. \$ 890 = Principal.

.06 = Rate.

$\$ 53.40 = 1 \text{ year's int.}$

$\begin{array}{r} 51\frac{9}{10} \\ \hline 26700 \end{array}$

3233

Ans.  $\$ 299.33 = \text{Interest.}$

24. \$ 5000 = Principal.

.07 = Rate.

$\$ 350.00 = 1 \text{ year's int.}$

$\begin{array}{r} 31\frac{1}{2} \\ \hline 105000 \end{array}$

33055

$\$ 1380.55\frac{1}{2} = \text{Interest.}$

5000.00

Ans.  $\$ 6380.55\frac{1}{2} = \text{Amount.}$

## Article 262.

28.

2 ) \$ 56.80 = Principal.

.2840 = 1 mo.'s int.

$20\frac{1}{2} = \text{Time in mo.}$

$\begin{array}{r} 56800 \\ \hline 1609\frac{1}{2} \end{array}$

Ans.  $\$ 5.8409\frac{1}{2} = \text{Interest.}$

29.

2 ) \$ 6000 = Principal.

30.00 = 1 mo.'s int.

50 = Time in mo.

Ans.  $\$ 1500.00 = \text{Interest.}$



30.

$$2) \$17.28 = \text{Principal.}$$

$$\underline{.0864} = 1 \text{ mo.'s int.}$$

$$\underline{23\frac{1}{10}} = \text{Time in mo.}$$

$$2592$$

$$1728$$

$$86\frac{2}{3}$$

$$\text{Ans. } \$1.9958\frac{2}{3} = \text{Interest.}$$

31.

$$2) \$1850.75 = \text{Principal.}$$

$$\underline{9.25375} = 1 \text{ mo.'s int.}$$

$$\underline{9\frac{1}{2}} = \text{Time in mo.}$$

$$740300$$

$$8328375$$

$$\text{Ans. } \$90.686\frac{1}{2} = \text{Interest.}$$

32.

$$2) \$253.50 = \text{Principal.}$$

$$\underline{1.2675} = 1 \text{ mo.'s int.}$$

$$\underline{28\frac{7}{10}} = \text{Time in mo.}$$

$$2957\frac{1}{2}$$

$$101400$$

$$25350$$

$$\text{Ans. } \$35.7857\frac{1}{2} = \text{Int.}$$

33.

$$2) \$85.90 = \text{Principal.}$$

$$\underline{.4295} = 1 \text{ mo.'s int.}$$

$$\underline{42\frac{9}{10}} = \text{Time in mo.}$$

$$8590$$

$$17180$$

$$3865\frac{1}{2}$$

$$\text{Ans. } \$18.4255\frac{1}{2} = \text{Interest.}$$

34.

$$2) \$1992.25 = \text{Principal.}$$

$$\underline{9.96125} = 1 \text{ mo.'s int.}$$

$$\underline{3\frac{1}{10}} = \text{Time in mo.}$$

$$2988375$$

$$99612\frac{1}{2}$$

$$\text{Ans. } \$30.87987\frac{1}{2} = \text{Interest.}$$

35.

$$2) \$15600 = \text{Principal.}$$

$$\underline{78.00} = 1 \text{ mo.'s int.}$$

$$\underline{55\frac{1}{3}} = \text{Time in mo.}$$

$$39000$$

$$39000$$

$$4940$$

$$\text{Ans. } \$4339.40 = \text{Interest.}$$

36.

$$2) \$1400 = \text{Principal.}$$

$$\underline{\$7.00} = 1 \text{ mo.'s int.}$$

$$30 = \text{Time in mo.}$$

$$\underline{\$210.00} = \text{Interest.}$$

$$1400. = \text{Principal.}$$

$$\text{Ans. } \$1610.00 = \text{Amount.}$$

37.

$$2) \$7000 = \text{Principal.}$$

$$\underline{35.00} = 1 \text{ mo.'s int.}$$

$$63 = \text{Time in mo.}$$

$$10500$$

$$21000$$

$$\underline{\$2205.00} = \text{Int.}$$

$$7000. = \text{Principal.}$$

$$\text{Ans. } \$9205.00 = \text{Amount.}$$

## Article 263.

38.

$$\begin{array}{r}
 2) \$545 = \text{Principal.} \\
 \underline{2.725} = 1 \text{ mo.'s int.} \\
 8\frac{1}{2} = \text{Time in mo.} \\
 21800 \\
 2180
 \end{array}$$

$$\begin{array}{r}
 3) 23.980 = \text{Int. at 6\%} \\
 7.993\frac{1}{3} = \text{" 2\%} \\
 \text{Ans. } \$15.986\frac{2}{3} = \text{" 4\%}
 \end{array}$$

39.

$$\begin{array}{r}
 2) \$78.50 = \text{Principal.} \\
 \underline{.3925} = 1 \text{ mo.'s int.} \\
 4\frac{1}{10} = \text{Time in mo.} \\
 15700 \\
 392\frac{1}{2} \\
 6) 1.6092\frac{1}{2} = \text{Int. at 6\%} \\
 .2682\frac{1}{12} = \text{" 1\%} \\
 \text{Ans. } \$1.3410\frac{1}{12} = \text{" 5\%}
 \end{array}$$

40.

$$\begin{array}{r}
 2) \$64.70 = \text{Principal.} \\
 \underline{.3235} = 1 \text{ mo.'s int.} \\
 29 = \text{Time in mo.} \\
 29115 \\
 6470 \\
 6) 9.3815 = \text{Int. at 6\%} \\
 1.5635\frac{5}{6} = \text{" 1\%} \\
 \text{Ans. } \$10.9450\frac{5}{6} = \text{" 7\%}
 \end{array}$$

41.

$$\begin{array}{r}
 2) \$1440 = \text{Principal.} \\
 \underline{7.20} = 1 \text{ mo.'s int.} \\
 11\frac{3}{10} = \text{Time in mo.} \\
 720 \\
 720 \\
 552 \\
 4) 84.72 = \text{Int. at 6\%} \\
 21.18 = \text{" 1\frac{1}{2}\%} \\
 \text{Ans. } \$63.54 = \text{" 4\frac{1}{3}\%}
 \end{array}$$

42.

$$\begin{array}{r}
 2) \$9500 = \text{Principal.} \\
 \underline{47.50} = 1 \text{ mo.'s int.} \\
 42\frac{1}{10} = \text{Time in mo.} \\
 9500 \\
 19000 \\
 2691\frac{3}{4} \\
 6) 2021.91\frac{3}{4} = \text{Int. at 6\%} \\
 336.98\frac{1}{8} = \text{" 1\%} \\
 \text{Ans. } \$2358.90\frac{1}{8} = \text{" 7\%}
 \end{array}$$

43.

$$\begin{array}{r}
 2) \$600.80 = \text{Principal.} \\
 \underline{3.0040} = 1 \text{ mo.'s int.} \\
 35\frac{1}{10} = \text{Time in mo.} \\
 150200 \\
 90120 \\
 3004 \\
 3) 105.440\frac{4}{5} = \text{Int. at 6\%} \\
 35.1468 = \text{" 2\%} \\
 \text{Ans. } \$140.5872 = \text{" 8\%}
 \end{array}$$

44.

$$\begin{array}{r}
 2) \$20000 = \text{Principal.} \\
 \underline{100.00} = 1 \text{ mo.'s int.} \\
 21\frac{1}{10} = \text{Time in mo.} \\
 \underline{20000} \\
 1000 \\
 6) \underline{210.00} = \text{Int. at 6 \%} \\
 35.00 = \text{ " } 1 \% \\
 \text{Ans. } \$175.00 = \text{ " } 5 \%
 \end{array}$$

45.

$$\begin{array}{r}
 2) \$340.90 = \text{Principal.} \\
 \underline{1.7045} = 1 \text{ mo.'s int.} \\
 55\frac{1}{10} = \text{Time in mo.} \\
 \underline{85225} \\
 85225 \\
 6249\frac{1}{2} \\
 6) \underline{94.3724} = \text{Int. at 6 \%} \\
 15.7287\frac{1}{2} = \text{ " } 1 \% \\
 \text{Ans. } \$110.1012 = \text{ " } 7 \%
 \end{array}$$

46.

$$\begin{array}{r}
 2) \$15420 = \text{Principal.} \\
 \underline{77.10} = 1 \text{ mo.'s int.} \\
 9\frac{1}{2} = \text{Time in mo.} \\
 \underline{69390} \\
 6168 \\
 12) \underline{755.58} = \text{Int. at 6 \%} \\
 62.965 = \text{ " } \frac{1}{2} \% \\
 \text{Ans. } \$818.545 = \text{ " } 6\frac{1}{2} \%
 \end{array}$$

47.

$$\begin{array}{r}
 2) \$374.75 = \text{Principal.} \\
 \underline{1.87375} = 1 \text{ mo.'s int.} \\
 45 = \text{Time in mo.} \\
 \underline{936875} \\
 749500 \\
 3) \underline{84.31875} = \text{Int. at 6 \%} \\
 28.10625 = \text{ " } 2 \% \\
 \text{Ans. } \$112.42500 = \text{ " } 8 \%
 \end{array}$$

48. Time = 1 y. 1 mo. 11 d.

$$\begin{array}{r}
 2) \$525 = \text{Principal.} \\
 \underline{2.625} = 1 \text{ mo.'s int.} \\
 13\frac{1}{10} = \text{Time in mo.} \\
 \underline{7875} \\
 2625 \\
 962\frac{1}{2} \\
 6) \underline{35.087\frac{1}{2}} = \text{Int. at 6 \%} \\
 5847\frac{1}{2} = \text{ " } 1 \% \\
 \$40.935\frac{1}{2} = \text{ " } 7 \% \\
 525.
 \end{array}$$

Ans. \$565.935 = Amount.

49. Time = 1 y. 9 mo. 26 d.

$$\begin{array}{r}
 2) \$450.60 = \text{Principal.} \\
 \underline{2.2530} = 1 \text{ mo.'s int.} \\
 21\frac{1}{2} = \text{Time in mo.} \\
 \underline{22530} \\
 45060 \\
 19526 \\
 6) \underline{49.2656} = \text{Int. at 6 \%} \\
 8.2109 = \text{ " } 1 \% \\
 \$57.4765 = \text{ " } 7 \% \\
 450.60
 \end{array}$$

Ans. \$508.0765 = Amount.

**Article 264.**

- 52.** Time =  $\overline{132 \text{ d.}}$      $\$66.42$  = Principal.  
 Interest for  $\overline{60 \text{ d.}}$  =  $\overline{.6642}$  = .01 of principal.  
 " "  $\overline{60 \text{ "}}$  =  $\overline{.6642}$  = .01 " "  
 " "  $\overline{12 \text{ "}}$  =  $\overline{.13284}$  =  $\frac{1}{5}$  of 60 days' interest.  
 " "  $\overline{132 \text{ d.}}$  =  $\overline{\$1.46124}$  at 6%.  
 " " " =  $\overline{0.24354}$  " 1%.  
 " " " =  $\overline{\$1.21770}$  " 5%, Ans.
- 53.** Time =  $\overline{93 \text{ d.}}$      $\$8000$  = Principal.  
 Interest for  $\overline{60 \text{ d.}}$  =  $\overline{80.00}$  = .01 of principal.  
 " "  $\overline{30 \text{ "}}$  =  $\overline{40.00}$  =  $\frac{1}{2}$  of 60 days' interest.  
 " "  $\overline{3 \text{ "}}$  =  $\overline{4.00}$  =  $\frac{1}{10}$  of 30 days' interest.  
 " "  $\overline{93 \text{ d.}}$  =  $\overline{\$124.00}$  at 6%.  
 " " " =  $\overline{20.66\frac{2}{3}}$  " 1%.  
 " " " =  $\overline{\$144.66\frac{2}{3}}$  " 7%, Ans.
- 54.** Time =  $\overline{45 \text{ d.}}$      $\$130.50$  = Principal.  
 Interest for  $\overline{60 \text{ "}}$  =  $\overline{1.305}$  = .01 of principal.  
 " "  $\overline{30 \text{ d.}}$  =  $\overline{.6525}$  =  $\frac{1}{2}$  of 60 days' interest.  
 " "  $\overline{15 \text{ "}}$  =  $\overline{.32625}$  =  $\frac{1}{4}$  " 30 " "  
 " "  $\overline{45 \text{ d.}}$  =  $\overline{.97875}$  at 6%.  
 " " " =  $\overline{.32625}$  " 2%.  
 " " " =  $\overline{\$1.30500}$  " 8%, Ans.
- 55.** Time =  $\overline{81 \text{ d.}}$      $\$7500$  = Principal.  
 Interest for  $\overline{60 \text{ d.}}$  =  $\overline{75.00}$  = .01 of principal.  
 " "  $\overline{20 \text{ "}}$  =  $\overline{25.00}$  =  $\frac{1}{3}$  of 60 days' interest.  
 " "  $\overline{1 \text{ "}}$  =  $\overline{1.25}$  =  $\frac{1}{24}$  of 20 days' interest.  
 " "  $\overline{81 \text{ d.}}$  =  $\overline{\$101.25}$  at 6%, Ans.

56. 1 y. 3 mo. 6 d. = 456 d.

Time =	<u>456 d.</u>	<u>\$ 225</u>	= Principal.
Interest for	60 d. =	2.25	= .01 of principal.
" "	360 " =	13.50	= $6 \times 60$ days' interest.
" "	30 " =	1.125	= $\frac{1}{2}$ of " " "
" "	<u>6 " =</u>	<u>.225</u>	= $\frac{1}{2}$ " 30 " "
" "	456 d. =	\$ 17.100	at 6%, Ans.

57. 3 mo. 15 d. = 105 d.

Time =	<u>105 d.</u>	<u>\$ 163.20</u>	= Principal.
Interest for	60 d. =	\$ 1.632	= .01 of principal.
" "	30 " =	.816	= $\frac{1}{2}$ of 60 days' interest.
" "	<u>15 " =</u>	<u>.408</u>	= $\frac{1}{2}$ " 30 " "
" "	105 d. =	\$ 2.856	at 6%.
" "	" =	.476	" 1%.
" "	" =	\$ 4.760	" 10%.
		<u>163.20</u>	
Ans.	\$ 167.960, Amount.		

58. 1 y. 1 mo. 23 d. = 413 d.

Time =	<u>413 d.</u>	<u>\$ 900.65</u>	= Principal.
Interest for	60 d. =	9.0065	= .01 of principal.
" "	300 " =	45.0325	= $5 \times 60$ days' interest.
" "	30 " =	4.5032	= $\frac{1}{2}$ of " " "
" "	20 " =	3.0021	= $\frac{2}{3}$ " 30 " "
" "	<u>3 " =</u>	<u>.4503</u>	= $\frac{1}{10}$ " " " "
" "	413 d. =	\$ 61.9946	at 6%.
		<u>900.65</u>	
Ans.	\$ 962.6446 = Amount.		

59. 1 y. 1 mo. 12 d. = 402 d.

Time =	<u>402 d.</u>	\$ 4000	= Principal.
Interest for	60 d. =	\$ 40.00	= .01 of principal.
"	" 300 " =	200.00	= 5 × 60 days' interest.
"	" 40 " =	26.666 $\frac{2}{3}$	= $\frac{2}{3}$ of " " "
"	" 2 " =	1.333 $\frac{1}{3}$	= $\frac{1}{3}$ " 40 " "
"	" 402 d. =	\$ 268.00	at 6%.
"	" " =	67.00	" 1 $\frac{1}{2}$ %.
"	" " =	\$ 201.00	" 4 $\frac{1}{2}$ %, Ana.

60. 2 y. 8 mo. 29 d. = 989 d.

Time =	<u>989 d.</u>	\$ 653.63	= Principal.
Interest for	60 d. =	6.5363	= .01 of principal.
"	" 900 " =	98.0445	= 15 × 60 days' interest.
"	" 20 " =	2.1787	= $\frac{1}{3}$ of " " "
"	" 5 " =	.5446	= $\frac{1}{6}$ " 20 " "
"	" 4 " =	.4357	= $\frac{1}{6}$ " 20 " "
"	" 989 d. =	\$ 107.7398	at 6%.
"	" " =	17.9566	" 1%.
"	" " =	\$ 125.6964	" 7%.
		<u>653.63</u>	
Ans.	\$ 779.3264		Amount.

61. Time = 60 d. \$ 4498.25 = Principal.

Interest for 60 d. =	\$ 44.9825	= .01 of principal.
	<u>7.4970</u>	at 1%.
Interest for 60 d. =	\$ 37.4855	" 5%.
	<u>4498.25</u>	
Ans.	\$ 4535.7355	= Amount.

62. \$ 248 = Principal.

 $.03\frac{1}{2}$  = Rate.

744

124

\$ 8.68 = 1 year's interest.

0 $\frac{1}{10}$ Ans. \$ 4.774 = Interest at  $3\frac{1}{2}$  %.

63. \$ 845 = Principal.

 $.04$  = Rate.

\$ 33.80 = 1 year's int.

13 $\frac{73}{100}$ 

10140

3380

685 $\frac{7}{8}$ 

Ans. \$ 446.25 = Int. at 4 %.

64.

2 ) \$ 245.80 = Principal.

1.2290 = 1 mo.'s int.

29 $\frac{7}{10}$  = Time in mo.

110610

24580

2867

\$ 35.9277 = Int. at 6 %.

8.9819 = "  $1\frac{1}{2}$  %Ans. \$ 26.9458 = "  $4\frac{1}{2}$  %.

65.

2 ) \$ 960 = Principal.

4.80 = 1 mo.'s int.

43 $\frac{1}{10}$  = Time in mo.

1440

1920

144

\$ 207.84 = Int. at 6 %.

34.64 = " 1 %

Ans. \$ 173.20 = " 5 %.

66.

2 ) \$ 849.50 = Principal.

4.2475 = 1 mo.'s int.

100 $\frac{2}{3}$  = Time in mo.

4247500

16990

Ans. \$ 426.4490 = Int. at 6 %.

67.

2 ) \$ 2846 = Principal.

14.23 = 1 mo.'s int.

41 $\frac{1}{3}$  = Time in mo.

1423

5692

4743

\$ 588.173 = Int. at 6 %.

49.014 = "  $\frac{1}{2}$  %.Ans. \$ 637.187 = "  $6\frac{1}{2}$  %.

68.

$$\begin{array}{r}
 2) \$180 = \text{Principal.} \\
 \underline{.90} = 1 \text{ mo.'s int.} \\
 21\frac{1}{2} = \text{Time in mo.} \\
 \underline{90} \\
 180 \\
 \underline{45} \\
 \$19.35 = \text{Int. at 6 \%} \\
 3.225 = \text{ " } 1 \% \\
 \text{Ans. } \$22.575 = \text{ " } 7 \%
 \end{array}$$

69.

$$\begin{array}{r}
 2) \$948.39 = \text{Principal.} \\
 \underline{4.74195} = 1 \text{ mo.'s int.} \\
 47\frac{1}{2} = \text{Time in mo.} \\
 \underline{3319365} \\
 1896780 \\
 \underline{94839} \\
 \$223.82004 = \text{Int. at 6 \%} \\
 55.95501 = \text{ " } 1\frac{1}{2} \% \\
 \text{Ans. } \$279.77505 = \text{ " } 7\frac{1}{2} \%
 \end{array}$$

70.

$$\begin{array}{r}
 2) \$862 = \text{Principal.} \\
 \underline{4.31} = 1 \text{ mo.'s int.} \\
 55\frac{1}{2} = \text{Time in mo.} \\
 \underline{2155} \\
 2155 \\
 \underline{316} \\
 \$240.21 = \text{Int. at 6 \%} \\
 80.07 = \text{ " } 2 \% \\
 \text{Ans. } \$320.28 = \text{ " } 8 \%
 \end{array}$$

71.

$$\begin{array}{r}
 2) \$1500 = \text{Principal.} \\
 \underline{7.50} = 1 \text{ mo.'s int.} \\
 15\frac{2}{3} = \text{Time in mo.} \\
 \underline{3750} \\
 750 \\
 \underline{675} \\
 \$119.25 = \text{Int. at 6 \%} \\
 59.625 = \text{ " } 3 \% \\
 \text{Ans. } \$178.87\frac{1}{2} = \text{ " } 9 \%
 \end{array}$$

72.

$$\begin{array}{r}
 2) \$8400 = \text{Principal.} \\
 \underline{42.00} = 1 \text{ mo.'s int.} \\
 2\frac{3}{4} = \text{Time in mo.} \\
 \underline{8400} \\
 2380 \\
 \underline{\$107.80} = \text{Int. at 6 \%} \\
 23.35\frac{3}{4} = \text{ " } 1.3 \% \\
 \text{Ans. } \$131.15\frac{3}{4} = \text{ " } 7.3 \%
 \end{array}$$

73.

$$\begin{array}{r}
 2) \$9398 = \text{Principal.} \\
 \underline{46.99} = 1 \text{ mo.'s int.} \\
 1\frac{3}{4} = \text{Time in mo.} \\
 \underline{4699} \\
 28194 \\
 \underline{\$75.184} = \text{Int. at 6 \%} \\
 50.122 = \text{ " } 4 \% \\
 \text{Ans. } \$125.306 = \text{ " } 10 \%
 \end{array}$$



74.

$$\begin{array}{r}
 2) \$479.85 = \text{Principal.} \\
 \underline{2.39925} = 1 \text{ mo.'s int.} \\
 3\frac{8}{15} = \text{Time in mo.} \\
 \underline{719775} \\
 127960 \\
 \$8.47735 = \text{Int. at 6\%} \\
 \underline{1.41289} = \text{ " 1\%} \\
 \text{Ans. } \$7.06446 = \text{ " 5\%}
 \end{array}$$

75.

$$\begin{array}{r}
 2) \$948.25 = \text{Principal.} \\
 \underline{4.74125} = 1 \text{ mo.'s int.} \\
 2\frac{3}{8} = \text{Time in mo.} \\
 \underline{948250} \\
 458320 \\
 \$14.06570 = \text{Int. at 6\%} \\
 \underline{3.51642} = \text{ " 1}\frac{1}{2}\% \\
 \text{Ans. } \$10.54928 = \text{ " 4}\frac{1}{2}\%
 \end{array}$$

76.

$$\begin{array}{r}
 2) \$84.32 = \text{Principal.} \\
 \underline{.4216} = 1 \text{ mo.'s int.} \\
 1\frac{1}{2} = \text{Time in mo.} \\
 \underline{4216} \\
 2108 \\
 \$0.6324 = \text{Int. at 6\%} \\
 \underline{0.2108} = \text{ " 2\%} \\
 \text{Ans. } \$0.4216 = \text{ " 4\%}
 \end{array}$$

77.

$$\begin{array}{r}
 2) \$961.18 = \text{Principal.} \\
 \underline{4.8059} = 1 \text{ mo.'s int.} \\
 3\frac{7}{10} = \text{Time in mo.} \\
 \underline{144177} \\
 33641 \\
 \text{Ans. } \$17.7818 = \text{Int. at 6\%}
 \end{array}$$

78.

$$\begin{array}{r}
 \text{Time} = 4 \text{ mo. 21 d.} \\
 2) \$549.82 = \text{Principal.} \\
 \underline{2.7491} = 1 \text{ mo.'s int.} \\
 4\frac{7}{10} = \text{Time in mo.} \\
 \underline{109964} \\
 19243 \\
 \$12.9207 = \text{Int. at 6\%} \\
 \underline{6.4603} = \text{ " 3\%} \\
 \underline{\$19.3810} = \text{ " 9\%} \\
 549.82 \\
 \text{Ans. } \$569.2010 = \text{Amount.}
 \end{array}$$

79.

$$\begin{array}{r}
 \text{Time} = 7 \text{ mo. 18 d.} \\
 2) \$856.84 = \text{Principal.} \\
 \underline{4.2842} = 1 \text{ mo.'s int.} \\
 7\frac{3}{8} = \text{Time in mo.} \\
 \underline{299894} \\
 25705 \\
 \$32.5599 = \text{Int. at 6\%} \\
 \underline{10.8533} = \text{ " 2\%} \\
 \underline{\$43.4132} = \text{ " 8\%} \\
 856.84 \\
 \text{Ans. } \$900.2532 = \text{Amount.}
 \end{array}$$

**80.**

Time = 2 mo. 7 d.

$$\begin{array}{r}
 2) \$1248 = \text{Principal.} \\
 \underline{6.24} = 1 \text{ mo.'s int.} \\
 \underline{2\frac{7}{10}} = \text{Time in mo.} \\
 1248 \\
 1456 \\
 \hline
 \end{array}$$

 $\$13.936 = \text{Int. at } 6\%.$  $\underline{1248.}$ Ans.  $\$1261.936 = \text{Amount.}$ **81.**

Time = 1 y. 6 mo. 4 d.

$$\begin{array}{r}
 2) \$960.50 = \text{Principal.} \\
 \underline{4.8025} = 1 \text{ mo.'s int.} \\
 \underline{18\frac{2}{3}} = \text{Time in mo.} \\
 384200 \\
 48025 \\
 \hline
 \end{array}$$

 $\underline{6403\frac{1}{2}}$  $\$87.0853 = \text{Int. at } 6\%.$  $\underline{21.7713} = \text{ " } 1\frac{1}{2}\%.$  $\underline{\$65.3140} = \text{ " } 4\frac{1}{2}\%.$  $\underline{960.50}$ Ans.  $\$1025.8140 = \text{Amount.}$ **82.**

Time = 3 mo. 6 d.

$$\begin{array}{r}
 2) \$849.25 = \text{Principal.} \\
 \underline{4.24625} = 1 \text{ mo.'s int.} \\
 \underline{3\frac{1}{2}} = \text{Time in mo.} \\
 1273875 \\
 84925 \\
 \hline
 \end{array}$$

 $\$13.58800 = \text{Int. at } 6\%.$  $\underline{2.26466\frac{2}{3}} = \text{ " } 1\%.$  $\underline{\$11.32333\frac{1}{3}} = \text{ " } 5\%.$  $\underline{849.25}$ Ans.  $\$860.57333\frac{1}{3} = \text{Amount.}$ **83.**

Time = 2 y. 4 mo. 14 d.

$$\begin{array}{r}
 2) \$562.75 = \text{Principal.} \\
 \underline{2.81375} = 1 \text{ mo.'s int.} \\
 \underline{28\frac{7}{8}} = \text{Time in mo.} \\
 2251000 \\
 562750 \\
 \hline
 \end{array}$$

 $\underline{131308}$  $\$80.09808 = \text{Int. at } 6\%.$  $\underline{13.34968} = \text{ " } 1\%.$  $\underline{\$93.44776} = \text{ " } 7\%.$  $\underline{562.75}$ Ans.  $\$656.19776 = \text{Amount.}$

**84.**

Time = 7 mo. 5 d.

2) \$476.84 = Principal.

2.3842 = 1 mo.'s int.

 $7\frac{1}{2}$  = Time in mo.166894

3973

\$17.0867 = Int. at 6%.

4.2716 = "  $1\frac{1}{2}$ %\$21.3583 = "  $7\frac{1}{2}$ %

476.84

Ans. \$498.1983 = Amount.

**85.**

Time = 3 mo. 29 d.

2) \$942 = Principal.

4.71 = 1 mo.'s int.

 $3\frac{2}{3}$  = Time in mo.1413

4553

\$18.683 = Int. at 6%.

7.784 = "  $2\frac{1}{2}$ %.\$10.899 = "  $3\frac{1}{2}$ %.

942.00

Ans. \$952.899 = Amount.

**86.**

Time = 1 y. 8 mo. 25 d.

2) \$1728 = Principal.

8.64 = 1 mo.'s int.

 $20\frac{1}{2}$  = Time in mo.17280

720

\$180.00 = Int. at 6%

60.00 = " 2%

\$240.00 = " 8%

1728.00

Ans. \$1968.00 = Amount.

**87.**

Time = 3 mo. 6 d.

2) \$945.96 = Principal.

4.7298 = 1 mo.'s int.

 $3\frac{1}{2}$  = Time in mo.141894

94596

\$15.13536 = Int. at 6%

7.56768 = " 3%

\$22.70304 = " 9%

945.96

Ans. \$968.66304 = Amount.

88.

Time = 2 mo. 27 d.

2) \$ 200 = Principal.

 $\frac{1.00}{200} = 1 \text{ mo.'s int.}$  $\frac{2\frac{2}{10}}{200} = \text{Time in mo.}$ 

200

90

\$ 2.900 = Int. at 6 %.

0.4833 $\frac{1}{3}$  = " 1 %.\$ 4.833 $\frac{1}{3}$  = " 10 %.

200.00

Ans. \$ 204.833 $\frac{1}{3}$  = Amount.

89.

Time = 1 y. 5 mo. 27 d.

2) \$ 816.42 = Principal.

 $\frac{4.0821}{285747} = 1 \text{ mo.'s int.}$  $\frac{17\frac{2}{10}}{285747} = \text{Time in mo.}$ 

285747

40821

36738

\$ 73.0695 = Int. at 6 %.

12.1782 = " 1 %.

\$ 85.2477 = " 7 %.

816.42

Ans. \$ 901.6677 = Amount.

90.

Time = 4 y. 5 mo.

2) \$ 945.55 = Principal.

 $\frac{4.72775}{1418325} = 1 \text{ mo.'s int.}$  $\frac{53}{1418325} = \text{Time in mo.}$ 

1418325

2363875

\$ 250.57075 = Int. at 6 %.

41.76179 = " 1 %.

\$ 292.33254 = " 7 %.

945.55

Ans. \$ 1237.88254 = Am't.

91.

Time = 3 mo. 11 d.

2) \$ 624.87 = Principal.

 $\frac{3.12435}{937305} = 1 \text{ mo.'s int.}$  $\frac{3\frac{1}{10}}{937305} = \text{Time in mo.}$ 

937305

114559

\$ 10.51864 = Int. at 6 %.

1.75310 = " 1 %.

\$ 8.76554 = " 5 %.

624.87

Ans. \$ 633.63554 = Amount.

**Article 265.**93. Time = 111 days. \$ 3000  $\times$  .05 = \$ 150.

$$\begin{array}{r} 30 \\ \$ 150 \times 111 \\ \hline 365 \end{array} = \$ 45.62, \text{ Ans.}$$

73

94. Time = 134 days.  $\$1000 \times .04\frac{1}{2} = \$45.$

$$\begin{array}{r} 9 \\ \$45 \times 134 \\ \hline 365 \\ 73 \end{array} = \$16.52, \text{ Ans.}$$

95. Time = 303 days.  $\$225.50 \times .06 = \$13.53.$

$$\frac{\$13.53 \times 303}{365} = \$11.23; \$225.50 + \$11.23 = \$236.73, \text{ Ans.}$$

97.

$$\$250 \times .01 \times 1\frac{1}{2} = \$3.125; \$28.12\frac{1}{2} \div \$3.125 = 9\%, \text{ Ans.}$$

### Article 266.

98.  $\$1400 \times .01 \times 1\frac{1}{2} = \$21; \$126 \div \$21 = 6\%, \text{ Ans.}$

99.  $\$1000 \times .01 \times 4\frac{7}{10} = \$47; \$282 \div \$47 = 6\%, \text{ Ans.}$

100.  $\$416 \times .01 \times 3\frac{2}{5} = \$12.66\frac{2}{3};$

$$\$88.64 \div \$12.66\frac{2}{3} = 6\frac{1}{3}\frac{1}{3}\%, \text{ Ans.}$$

101.

$$\$1600 \times .01 \times \frac{1}{2} = \$2.93\frac{1}{3}; \$46.20 \div \$2.93\frac{1}{3} = 15\frac{1}{2}\%, \text{ Ans.}$$

102.  $\$250.58 - \$241.20 = \$9.38.$

$$\$241.20 \times .01 \times \frac{5}{9} = \$1.34; \$9.38 \div \$1.34 = 7\%, \text{ Ans.}$$

103.

$$\$480 \times .01 \times 2\frac{1}{2} = \$11.60; \$52.20 \div \$11.60 = 4\frac{1}{2}\%, \text{ Ans.}$$

104. Time = 2 mo. 6 d.

$$\$640 \times .01 \times \frac{11}{60} = \$1.17\frac{1}{3}; \$10.56 \div \$1.17\frac{1}{3} = 9\%, \text{ Ans.}$$

105.  $\$1084 - \$960 = \$124$ , interest.

$\$960 \times .01 \times 1\frac{7}{4} = \$12.40$ ;  $\$124 \div \$12.40 = 10\%$ , Ans.

106.  $\$444 \times .01 \times 6\frac{1}{2} = \$28.49$ ;  $\$156.695 \div \$28.49 = 5\frac{1}{2}\%$ , Ans.

107.  $\$500 \times 2 = \$1000$ , interest;  $\$25000 \times .01 \times 1 = \$250$ .  
 $\$1000 \div \$250 = 4\%$ , Ans.

109.  $\$140 \times .07 = \$9.80$ ;  $\$49.00 \div \$9.80 = 5$  years, Ans.

### Article 267.

110.  $\$98 \times .08 = \$7.84$ ;  $\$23.48 \div \$7.84 = 2\frac{11}{14}$ .  
 $2\frac{11}{14}$  y. = 2 y. 11 mo.  $28\frac{1}{2}$  d., Ans.

111.  $\$75 \times .06 = \$4.50$ ;  $\$6.25 \div \$4.50 = 1\frac{7}{9}$ .  
 $1\frac{7}{9}$  y. = 1 y. 4 mo. 20 d., Ans.

112.  $\$3600 \times .07 = \$252$ ;  $\$46.20 \div \$252 = \frac{11}{60}$ .  
 $\frac{11}{60}$  y. = 2 mo. 6 d., Ans.

113.  $\$875 \times .06 = \$52.50$ ;  $\$7.00 \div \$52.50 = \frac{2}{15}$ .  
 $\frac{2}{15}$  y. = 1 mo. 18 d., or 48 d., Ans.

114.  $\$9080 \times .03\frac{1}{2} = \$317.80$ ;  $\$794.50 \div \$317.80 = 2\frac{1}{2}$ .  
 $2\frac{1}{2}$  y. = 2 y. 6 mo., Ans.

115.  $\$750 \times .06 = \$45$ ;  $\$750 \div \$45 = 16\frac{2}{3}$ .  
 $16\frac{2}{3}$  y. = 16 y. 8 mo., Ans.

116.  $\$540 \times .04 = \$21.60$ ;  $\$700 - \$540 = \$160$ , interest.  
 $\$160 \div \$21.60 = 7\frac{1}{2}$ ;  $7\frac{1}{2}$  y. = 7 y. 4 mo.  $26\frac{2}{3}$  d., Ans.

117.  $\$892 \times .10 = \$89.20$ ;  $\$187 \div \$89.20 = 2\frac{43}{48}$ .  
 $2\frac{43}{48}$  y. = 2 y. 1 mo.  $4\frac{1}{2}$  d., Ans.

118.  $\$12000 \times .04\frac{1}{2} = \$540$ ;  $\$2500 \div \$540 = 4\frac{1}{2}$ .  
 $4\frac{1}{2}$  y. = 4 y. 7 mo.  $16\frac{2}{3}$  d., Ans.

119.  $\$6000 - \$4500 = \$1500$ ;  $\$4500 \times .03\frac{1}{2} = \$157.50$ .  
 $\$1500 \div \$157.50 = 9\frac{1}{2}$ ;  $9\frac{1}{2}$  y. = 9 y. 6 mo.  $8\frac{1}{2}$  d., Ans.

122.  $\$1 \times .06 \times 1\frac{7}{8} = \$0.08\frac{1}{2}$ ;  $\$6.25 \div \$0.08\frac{1}{2} = \$75$ , Ans.

### Article 268.

#### 123.

$\$1 \times .07 \times \frac{11}{60} = \$0.012\frac{1}{2}$ ;  $\$46.20 \div \$0.012\frac{1}{2} = \$3600$ , Ans.

124.  $\$1 \times .04 \times 1\frac{1}{2} = \$0.06$ ;  $\$1 + \$0.06 = \$1.06$ .  
 $\$318 \div \$1.06 = \$300$ , Ans.

125.  $\$1 \times .05 \times \frac{4}{9} = \$0.02\frac{2}{3}$ ;  $\$1 + \$0.02\frac{2}{3} = \$1.02\frac{2}{3}$ .  
 $\$734.20 \div \$1.02\frac{2}{3} = \$718.23\frac{1}{3}$ , Ans.

126.  $\$1 \times .06 = \$0.06$ ;  $\$210 \times 4 = \$840$ , annual income.  
 $\$840 \div \$0.06 = \$14000$ , Ans.

127.  $\$1 \times .05 = \$0.05$ ;  $\$1200 \div \$0.05 = \$24000$ , Ans.

#### 128.

$\$1 \times .07 \times 2\frac{1}{2} = \$0.175$ ;  $\$118.23 \div \$0.175 = \$675.60$ , Ans.

129.  $3\frac{1}{2}\% \times 2 = 6\frac{1}{2}\%$  annually;  $\$1 \times .06\frac{1}{2} = \$0.065$ .

$\$924 \div \$0.065 = \$14215.38\frac{1}{3}$ , Ans.

130.  $\$1 \times .04 = \$0.04$ ;  $\$560 \div \$0.04 = \$14000$ , Ans.

131.  $\$1 \times .09 = \$0.09$ ;  $\$324 \times 4 = \$1296$ , income.

$\$1296 \div \$0.09 = \$14400$ , Ans.

132.  $\$5400 \times 365 = \$1971000$ , annual income.

$\$1971000 \div 2 = \$985500$ .

$\$985500 \div .08 = \$12318750$ , invested in railroad stock.

$\$985500 \div .04 = \$24637500$ , “ “ gov't securities.

$\$12318750 + \$24637500 = \$36956250$ , Ans.

### Article 282

#### 134.

Principal. . . . .	\$ 600.00
Int. from Jan. 6, 1880, to Apr. 6, 1880, 3 mo. . . . .	10.50
Amount . . . . .	<u>\$ 610.50</u>
1st payment . . . . .	50.00
New principal . . . . .	<u>\$ 560.50</u>
Int. from Apr. 6, 1880, to Nov. 21, 1880, 7 mo. 15 d. . . . .	24.52
Amount . . . . .	<u>\$ 585.02</u>
2d payment . . . . .	60.50
New principal . . . . .	<u>\$ 524.52</u>
Int. from Nov. 21, 1880, to Mar. 31, 1881, 4 mo. 10 d. . . . .	13.26
Amount . . . . .	<u>\$ 537.78</u>
3d payment . . . . .	150.00
New principal . . . . .	<u>\$ 387.78</u>
Int. from Mar. 31, 1881, to June 30, 1881, 3 mo. . . . .	6.79
Amount due June 30, 1881, . . . . . Ans.	<u>\$ 394.57</u>



126 KEY

116.  $\$540 \times .04$

$\$160 \div \$1$

117.  $\$892 \times .1$

$\frac{2}{1}$

118.  $\$12000 \times$

119.  $\$6000 -$

$\$1500 \div$

122.  $\$1 \times .1$

$\$1 \times .07$

124.  $\$1$

125.

126

KEY TO THE CURRENCY EXERCISES

THE

...	...	\$750.00
...	...	9.95
...	...	\$759.95
...	...	325.00
...	...	\$434.95
...	...	16.00
...	...	\$450.95
...	...	25.00
...	...	\$425.95
...	...	22.97
...	Ans.	\$448.95

THE

...	...	\$1500.00
...	...	53.13
...	...	48.96
...	...	\$1602.09
...	...	\$45
...	500	\$545.00
...	...	\$1067.09
...	10 d.	27.90
...	...	\$1084.99
...	...	600.00
...	...	\$484.99
...	...	7.07
...	Ans.	\$492.06

\$563.50

14.24

\$577.74

250.00

\$327.74

14.66

\$342.40

## 138.

\$ 3000.

*Boston, Feb. 9, 1880.*

For value received I promise to pay CHARLES E. LOWE, or order, three thousand dollars, on demand, with interest at 5 per cent.

Indorsements: Mar. 9, 1881, \$1000; Nov. 24, 1881, \$800.

Principal . . . . .	\$ 3000.00
Int. from Feb. 9, 1880, to March 9, 1881, 1 y. 1 m.	162.50
Amount . . . . .	<u>\$ 3162.50</u>
1st payment . . . . .	1000.00
New principal . . . . .	<u>\$ 2162.50</u>
Int. from Mar. 9, 1881, to Nov. 24, 1881, 8 m. 15 d.	76.59
Amount . . . . .	<u>\$ 2239.09</u>
2d payment . . . . .	800.00
New principal . . . . .	<u>\$ 1439.09</u>
Int. from Nov. 24, 1881, to Jan. 3, 1882, 1 mo. 10 d.	7.99
Amount due Jan. 3, 1882 . . . . .	Ans. <u>\$ 1447.08</u>

## 139.

Principal . . . . .	\$ 1200.00
Int. from Aug. 7, 1880, to May 13, 1881, 9 m. 6 d. .	36.80
Amount . . . . .	<u>\$ 1236.80</u>
1st payment . . . . .	300.00
New principal . . . . .	<u>\$ 936.80</u>
Int. from May 13, 1881, to Nov. 23, 1882, 1 y. 6 m. 10 d.	57.25
Amount . . . . .	<u>\$ 994.05</u>
2d payment . . . . .	275.00
New principal . . . . .	<u>\$ 719.05</u>
Int. from Nov. 23, 1882, to Jan 1, 1883, 1 m. 9 d. .	3.12
Amount due Jan. 1, 1883 . . . . .	Ans. <u>\$ 722.17</u>

## 140.

Principal . . . . .	\$ 6000.00
Int. from Jan. 1, 1879, to Aug. 11, 1879, 7 m. 10 d.	275.00
Amount . . . . .	<u>\$ 6275.00</u>
1st payment . . . . .	400.00
New principal . . . . .	<u>\$ 5875.00</u>
Int. from Aug. 11, 1879, to Dec. 15, 1880, 1y. 4m. 4d.	592.40
Amount . . . . .	<u>\$ 6467.40</u>
2d payment . . . . .	700.00
New principal . . . . .	<u>\$ 5767.40</u>
Int. from Dec. 15, 1880, to May 15, 1881, 5 m. . .	180.23
Amount due May 15, 1881 . . . . . Ans.	<u>\$ 5947.63</u>

## 141.

Principal . . . . .	\$ 500.00
Int. from Jan. 1, 1879, to Jan. 1, 1880, 1 y. . . .	50.00
Amount . . . . .	<u>\$ 550.00</u>
1st payment . . . . .	100.00
New principal . . . . .	<u>\$ 450.00</u>
Int. from Jan. 1, 1880, to Jan. 1, 1881, 1 y. . . .	45.00
Amount . . . . .	<u>\$ 495.00</u>
2d payment . . . . .	100.00
New principal . . . . .	<u>\$ 395.00</u>
Int. from Jan. 1, 1881, to June 19, 1881, 5 m. 18 d. .	18.43
Amount due June 19, 1881 . . . . . Ans.	<u>\$ 413.43</u>

## 142.

Principal . . . . .	\$ 2400.00
Int. from Aug. 12, 1880, to Sept. 12, 1881, 1 y. 1 m.	117.00
“ “ Sept. 12, 1881, to Oct. 12, 1881, 1 m. . .	9.00
Amount . . . . .	<u>\$ 2526.00</u>
1st payment less than int. due . . . . . \$ 25	
2d payment . . . . . 700	725.00
New principal . . . . .	<u>\$ 1801.00</u>
Int. from Oct. 12, 1881, to Feb. 15, 1882, 4 m. 3 d.	27.69
Amount due Feb. 15, 1882 . . . . . Ans.	<u>\$ 1828.69</u>

## 143.

Principal . . . . .	\$ 1728.00
Int. from Nov. 23, 1878, to May 15, 1879, 5 m. 22 d. . . . .	74.30
Amount . . . . .	<u>\$ 1802.30</u>
1st payment . . . . .	248.00
New principal . . . . .	<u>\$ 1554.30</u>
Int. from May 15, 1879, to Aug. 28, 1880, 1y. 3m. 13d. . . . .	179.91
Amount . . . . .	<u>\$ 1734.21</u>
2d payment . . . . .	301.00
New principal . . . . .	<u>\$ 1433.21</u>
Int. from Aug. 28, 1880, to May 30, 1881, 9 m. 2 d. . . . .	97.46
Amount . . . . .	<u>\$ 1530.67</u>
3d payment . . . . .	300.00
New principal . . . . .	<u>\$ 1230.67</u>
Int. from May 30, 1881, to Nov. 10, 1881, 5 m. 11 d. . . . .	49.53
Amount due Nov. 10, 1881, . . . . .	Ans. <u>\$ 1280.20</u>

## Article 283.

## 145.

Amount of \$ 1164.50 for 1 y. . . . .	\$ 1246.02
“ \$ 250.00 “ 9 mo. 15 d. . . . .	\$ 263.85
“ \$ 315.00 “ 7 mo. 14 d. . . . .	328.72
“ \$ 100.00 “ 4 mo. . . . .	102.33
“ \$ 200.00 “ 1 mo. 19 d. . . . .	201.91
	<u>896.81</u>
	Ans. <u>\$ 349.21</u>

**Article 285.**

<b>151.</b> Principal for 1st year . . . . .	\$ 750.00
Interest    "    " . . . . .	37.50
Principal for 2d year . . . . .	<u>\$ 787.50</u>
Interest    "    " . . . . .	39.38
Principal for 3d year . . . . .	<u>\$ 826.88</u>
Interest    "    " . . . . .	41.34
Principal for 4th year . . . . .	<u>\$ 868.22</u>
Interest    "    " . . . . .	43.41
Compound amount for 4 years . . . .	<u>\$ 911.63</u>
Given principal . . . . .	750.00
Compound interest for 4 years . . . .	Ans. <u>\$ 161.63</u>

**Article 286.**

<b>152.</b> Principal for 1st year . . . . .	\$ 600.00
Interest    "    " . . . . .	30.00
Principal for 2d year . . . . .	<u>\$ 630.00</u>
Interest    "    " . . . . .	31.50
Principal for 3d year . . . . .	<u>\$ 661.50</u>
Interest    "    " . . . . .	33.08
Principal for 6 mo. . . . .	<u>\$ 694.58</u>
Interest    "    " . . . . .	17.36
Compound amount for 3 y. 6 mo. . . .	<u>\$ 711.94</u>
Given principal . . . . .	600.00
Compound interest for 3 y. 6 mo. . . .	Ans. <u>\$ 111.94</u>
 <b>153.</b> Principal for 1st year . . . . .	 \$ 320.00
Interest    "    " . . . . .	22.40
Principal for 2d year . . . . .	<u>\$ 342.40</u>
Interest    "    " . . . . .	23.97
Principal for 9 mo. . . . .	<u>\$ 366.37</u>
Interest    "    " . . . . .	19.23
Compound amount for 2 y. 9 mo. . . .	<u>\$ 385.60</u>
Given principal . . . . .	320.00
Compound interest for 2 y. 9 mo. . . .	Ans. <u>\$ 65.60</u>

## 154.

Principal for 1st year . . . . .	\$ 500.00
Interest " " . . . . .	<u>20.00</u>
Principal for 2d year . . . . .	\$ 520.00
Interest " " . . . . .	<u>20.80</u>
Principal for 3d year . . . . .	\$ 540.80
Interest " " . . . . .	<u>21.63</u>
Principal for 4th year . . . . .	\$ 562.43
Interest " " . . . . .	<u>22.50</u>
Principal for 4 mo. 15 d. . . . .	\$ 584.93
Interest " " . . . . .	<u>8.77</u>
Compound amount for 4 y. 4 mo. 15 d. .	\$ 593.70
Given principal . . . . .	<u>500.00</u>
Compound interest for 4 y. 4 mo. 15 d. Ans.	\$ 93.70

## 155.

Principal for 1st 6 mo. . . . .	\$ 1000.00
Interest " " . . . . .	<u>30.00</u>
Principal for 2d 6 mo. . . . .	\$ 1030.00
Interest " " . . . . .	<u>30.90</u>
Principal for 3d 6 mo. . . . .	\$ 1060.90
Interest " " . . . . .	<u>31.83</u>
Principal for 4th 6 mo. . . . .	\$ 1092.73
Interest " " . . . . .	<u>32.78</u>
Compound amount for 2 years . . . Ans.	\$ 1125.51

<b>156.</b> Principal for 1st 3 mo. . . . .	\$ 1200.00
Interest " " . . . . .	12.00
Principal for 2d 3 mo. . . . .	<u>\$ 1212.00</u>
Interest " " . . . . .	12.12
Principal for 3d 3 mo. . . . .	<u>\$ 1224.12</u>
Interest " " . . . . .	12.24
Principal for 4th 3 mo. . . . .	<u>\$ 1236.36</u>
Interest " " . . . . .	12.36
Principal for 5th 3 mo. . . . .	<u>\$ 1248.72</u>
Interest " " . . . . .	12.49
Principal for 6th 3 mo. . . . .	<u>\$ 1261.21</u>
Interest " " . . . . .	12.61
Compound amount for 1 y. 6 mo. . . Ans.	<u>\$ 1273.82</u>

<b>157.</b> Principal for 1st 6 mo. . . . .	\$ 200.00
Interest " " . . . . .	4.00
Principal for 2d 6 mo. . . . .	<u>\$ 204.00</u>
Interest " " . . . . .	4.08
Principal for 3d 6 mo. . . . .	<u>\$ 208.08</u>
Interest " " . . . . .	4.16
Compound amount for 1 y. 6 mo. . . Ans.	<u>\$ 212.24</u>

<b>158.</b> Simple int. of \$2000 for 1 y. 8 mo. 24 d.=	\$ 208.00
Principal . . . . .	2000.00
Amount of \$ 2000 for 1 y. 8 mo. 24 d. .	<u>\$ 2208.00</u>
Principal for 1 year . . . . .	<u>\$ 2000.00</u>
Interest " " . . . . .	140.00
Principal for 8 mo. 24 d. . . . .	<u>\$ 2140.00</u>
Interest " " . . . . .	109.85
Compound amount for 1 y. 8 mo. 24 d. .	<u>\$ 2249.85</u>

\$ 2249.85 — \$ 2208 = \$ 41.85, gain, Ans.

159. Principal for 1st 6 mo. . . . .	\$ 300.00
Interest " " . . . . .	<u>12.00</u>
Principal for 2d 6 mo. . . . .	\$ <u>312.00</u>
Interest " " . . . . .	<u>12.48</u>
Principal for 3d 6 mo. . . . .	\$ <u>324.48</u>
Interest " " . . . . .	<u>12.98</u>
Principal for 4th 6 mo. . . . .	\$ <u>337.46</u>
Interest " " . . . . .	<u>13.50</u>
Principal for 5th 6 mo. . . . .	\$ <u>350.96</u>
Interest " " . . . . .	<u>14.04</u>
Principal for 6th 6 mo. . . . .	\$ <u>365.00</u>
Interest " " . . . . .	<u>14.60</u>
Principal for 7th 6 mo. . . . .	\$ <u>379.60</u>
Interest " " . . . . .	<u>15.18</u>
Principal for 8th 6 mo. . . . .	\$ <u>394.78</u>
Interest " " . . . . .	<u>15.79</u>
Principal for 9th 6 mo. . . . .	\$ <u>410.57</u>
Interest " " . . . . .	<u>16.42</u>
Principal for 2 mo. 12 d. . . . .	\$ <u>426.99</u>
Interest " " . . . . .	<u>6.83</u>
Compound amount for 4 y. 8 mo. 12 d. .	\$ 433.82
Given principal . . . . .	300.00
Compound int. for 4 y. 8 mo. 12 d. . Ans.	<u>\$ 133.82</u>

**Article 287.**

161. Amount of \$1 for 20 y. at 7%, from Table = \$ 3.869684.  
 Amount of \$500 for 20 y. at 7% = \$ 3.869684  $\times$  500 =  
 \$ 1934.84, Ans.

162. Amount of \$1 for 14 y. at 8%, from table = \$ 2.937194.  
 Amount of \$120 for 14 y. at 8% = \$ 2.937194  $\times$  120 = \$ 352.46  
 Given principal . . . . . 120.00  
 Compound interest of \$120 for 14 y. at 8% . Ans. \$ 232.46



**Article 291**

7.  $\$1 \times .07 \times 4 = \$0.28$ ;  $\$1 + \$0.28 = \$1.28$ .  
 $\$192 \div \$1.28 = \$150$ ;  $\$192 - \$150 = \$42$ , Ans.

**Article 292**

8.  $\$1 \times .07 \times 1\frac{1}{2} = \$0.105$ ;  $\$1 + \$0.105 = \$1.105$ .  
 $\$3450 \div \$1.105 = \$3122.17$ , Ans.
9.  $\$1 \times .06 \times 3\frac{1}{2} = \$0.20$ ;  $\$1 + \$0.20 = \$1.20$ .  
 $\$172.86 \div \$1.20 = \$144.05$ ;  $\$172.86 - \$144.05 =$   
 $\$28.81$ , Ans.
10.  $\$1 \times .04 \times \frac{1}{4} = \$0.01$ ;  $\$1 + \$0.01 = \$1.01$ .  
 $\$360 \div \$1.01 = \$356.44$ , Ans.
11.  $\$1 \times .07 \times 2\frac{1}{2} = \$0.175$ ;  $\$5000 \times .175 = \$875$ , int.  
 $\$1 + \$0.175 = \$1.175$ ;  $\$5000 \div \$1.175 = \$4255.32$ .  
 $\$5000 - \$4255.32 = \$744.68$ , discount.  
 $\$875 - \$744.68 = \$130.32$ , Ans.
12.  $\$1 \times .06 \times 2\frac{1}{2} = \$0.1575$ ;  $\$1 + \$0.1575 = \$1.1575$ .  
 $\$347.25 \div \$1.1575 = \$300$ , Ans.

**Article 294.**

13.  $\$125 \times .05 = \$6.25$ , Ans.
14.  $\$350 \times .06 = \$21$ ;  $\$350 - \$21 = \$329$ , Ans.
15.  $\$1344.50 \times .02 = \$26.89$ , Ans.
16.  $\$460.50 \times .10 = \$46.05$ ;  $\$460.50 - \$46.05 = \$414.45$ .  
 $\$414.45 \times .05 = \$20.72$ ;  $\$414.45 - \$20.72 =$   
 $\$393.73$ , Ans.

$$17. 100\% - 6\% = 94\%; \$433 = 94\%.$$

$$\frac{\$433}{94} \times 100 = \$460.64, \text{ Ans.}$$

$$18. \$1600 \times .25 = \$400; \$1600 - \$400 = \$1200.$$

$$\$1200 \times .05 = \$60; \$1200 - \$60 = \$1140.$$

$$\$1600 \times .70 = \$1120; \$1140 - \$1120 = \$20, \text{ Ans.}$$

19.

*Boston, Oct. 19, 1881.*

TAYLOR &amp; AMES,

Bought of LEE &amp; SHEPARD.

200 Harper's Geography @ 95¢, 10% off .....	\$ 171	00
50 Harrington's Graded Speller @ 18½¢, 7½% off .....	8	56
3 Cases School Slates @ \$6.35, 20% off .....	15	24
25 Webster's School Dictionary @ \$1.12, 12½% off .....	24	50
	\$ 219	30

$$\$219.30 \times .02\frac{1}{2} = \$5.48; \$219.30 - \$5.48 = \$213.82, \text{ Ans.}$$

20.

62 yd. Brussels carpeting @ \$1.87½ .....	\$ 116	25
118½ " 3-ply carpet @ 90¢ .....	106	65
1 set parlor furniture .....	285	
1 " black walnut chamber furniture .....	125	
1 " " " " " " .....	140	
	\$ 772	90

$$\$772.90 \times .05 = \$38.65; \$772.90 - \$38.65 = \$734.25, \text{ Ans.}$$

**Article 300.**

23. Term of discount, 123 days ... Face of note, \$875.00	
Interest for 60 " .....	\$ 8.75
" " 60 " .....	8.75
" " 3 " .....	.437
Bank discount, \$17.94	} Ans.
Proceeds, \$857.06	

## 24.

Term of discount, 183 days.....	Face of note, \$ 85.60	
Interest for       60 " .....		.856
"       "       120 " .....		1.712
"       "       3 " .....		.042
"       at 6 % .....		\$ 2.610
"       "   1 % .....		.435
"       "   7 % .....	Bank discount,	\$ 3.05
	Proceeds,	\$ 82.55 } Ans.

25. 93 d. after Jan. 4, 1881, = Apr. 7, 1881, day of maturity.  
 From Feb. 3, 1881, to Apr. 7, 1881, = 63 d., term of discount.  
 Interest of \$ 600 for 63 d. at 6 % = \$ 6.30, bank discount.

$$\text{\$ 600} - \text{\$ 6.30} = \text{\$ 593.70, proceeds, Ans.}$$

26. 4 mo. 3 d. = 123 d., day of maturity.  
 123 d. — 15 d. = 108 d., term of discount.  
 Interest of \$ 5000 for 108 d. at 8 % = \$ 120, bank discount.

$$\text{\$ 5000} - \text{\$ 120} = \text{\$ 4880, proceeds, Ans.}$$

27. Interest of \$ 10500 for 6 mo. 3 d. at 6 % = \$ 320.25.  
 $\text{\$ 10500} + \text{\$ 320.25} = \text{\$ 10820.25}$ , amount due at maturity.  
 6 mo. 3 d. = 183 d., time of maturity.  
 183 d. — 60 d. = 123 d., term of discount.  
 Int. of \$ 10820.25 for 123 d. at 5 % = \$ 184.85, bank discount.

$$\text{\$ 10820.25} - \text{\$ 184.85} = \text{\$ 10635.40, proceeds, Ans.}$$

28. 4 mo. 3 d. after Jan. 14 = May 17, day of maturity.  
 From Feb. 27 to May 17 = 79 d., term of discount.  
 Interest of \$ 485.96 for 79 d. at 6 % = \$ 6.40, bank discount.

$$\text{\$ 485.96} - \text{\$ 6.40} = \text{\$ 479.56, proceeds, Ans.}$$

29. 3 mo. 3 d. after Feb. 12 = May 15, day of maturity.  
From Mar. 8 to May 15 = 68 d., term of discount.  
Interest of \$ 966 for 68 d. at 7% = \$ 12.77, bank discount.  
 $\$ 966 - \$ 12.77 = \$ 953.23$ , proceeds, Ans.
30. 2 mo. 3 d. after Apr. 1 = June 4, day of maturity.  
From Apr. 15 to June 4 = 50 d., term of discount.  
Interest of \$ 1024 for 50 d. at  $7\frac{1}{2}\%$  = \$ 10.67, bank discount.  
 $\$ 1024 - \$ 10.67 = \$ 1013.33$ , proceeds, Ans.
31. 63 d. after May 5 = July 7, day of maturity.  
From May 27 to July 7 = 41 d., term of discount.  
Interest of \$ 287 for 41 d. at 8% = \$ 2.61, bank discount.  
 $\$ 287 - \$ 2.61 = \$ 284.39$ , proceeds, Ans.
32. 93 d. after July 10 = Oct. 11, day of maturity.  
93 d. = term of discount.  
Interest of \$ 648.50 for 93 d. at 5% = \$ 8.38, bank discount.  
 $\$ 648.50 - \$ 8.38 = \$ 640.12$ , proceeds, Ans.
33. 5 mo. 3 d. after June 15 = Nov. 18, day of maturity.  
From Aug. 4 to Nov. 18 = 106 d., term of discount.  
Interest of \$ 984 for 106 d. at 9% = \$ 26.07, bank discount.  
 $\$ 984 - \$ 26.07 = \$ 957.93$ , proceeds, Ans.
34. 6 mo. 3 d. after Sept. 20 = Mar. 23, day of maturity.  
From Nov. 27 to Mar. 23 = 116 d., term of discount.  
Interest of \$ 328 for 116 d. at 4% = \$ 4.23, bank discount.  
 $\$ 328 - \$ 4.23 = \$ 323.77$ , proceeds, Ans.
35. 33 d. after Aug. 25 = Sept. 27, day of maturity.  
From Sept. 1 to Sept. 27 = 26 d., term of discount.  
Int. of \$ 696 for 26 d. at  $4\frac{1}{2}\%$  = \$ 2.26, bank discount.  
 $\$ 696 - \$ 2.26 = \$ 693.74$ , proceeds, Ans.

36. 1 mo. 3 d. after Oct. 31 = Dec. 3, day of maturity.  
From Nov. 1 to Dec. 3 = 32 d., term of discount.  
Int. of \$ 842.50 for 32 d. at  $3\frac{1}{2}\%$  = \$ 2.62, bank discount.  
 $\$ 842.50 - \$ 2.62 = \$ 839.88$ , proceeds, Ans.
37. 3 mo. 3 d. after Sept. 7 = Dec. 10, day of maturity.  
From Oct. 10 to Dec. 10 = 61 d., term of discount.  
Int. of \$ 500 for 61 d. at 6 % = \$ 5.08, bank discount.  
 $\$ 500 - \$ 5.08 = \$ 494.92$ , proceeds, Ans.
38. 78 d. after Nov. 12 = Jan. 29, day of maturity.  
From Dec. 15 to Jan. 29 = 45 d., term of discount.  
Int. of \$ 8643 for 45 d. at 7 % = \$ 75.63, bank discount.  
 $\$ 8643 - \$ 75.63 = \$ 8567.37$ , proceeds, Ans.
39. 4 mo. 3 d. after Jan. 17 = May 20, day of maturity.  
From Feb. 10 to May 20 = 99 d., term of discount.  
Int. of \$ 242.16 for 99 d. at 10 % = \$ 6.66, bank discount.  
 $\$ 242.16 - \$ 6.66 = \$ 235.50$ , proceeds, Ans.
40. 93 d. after Dec. 27 = Mar. 30, day of maturity.  
From Jan. 15 to Mar. 30 = 74 d., term of discount.  
Int. of \$ 800 for 74 d. at 3 % = \$ 4.93, bank discount.  
 $\$ 800 - \$ 4.93 = \$ 795.07$ , proceeds, Ans.
41. 3 mo. 3 d. after Mar. 5 = June 8, day of maturity.  
From May 1 to June 8 = 38 d., term of discount.  
Int. of \$ 560 for 38 d. at 8 % = \$ 4.73, bank discount.  
 $\$ 560 - \$ 4.73 = \$ 555.27$ , proceeds, Ans.
42. 6 mo. 3 d. after Dec. 11 = June 14, day of maturity.  
From March 18 to June 14 = 88 d., term of discount.  
Int. of \$ 576 for 88 d. at 5 % = \$ 7.04, bank discount.  
 $\$ 576 - \$ 7.04 = \$ 568.96$ , proceeds, Ans.

43. 4 mo. 3 d. after Aug. 8 = Dec. 11, day of maturity.  
From Oct. 27 to Dec. 11 = 45 d., term of discount.  
Int. of \$ 898.96 for 45 d. at 9% = \$ 10.11, bank discount.  
 $\$ 898.96 - \$ 10.11 = \$ 888.85$ , proceeds, Ans.

45. Bank discount of a \$ 1 note for 63 days = \$ 0.01225.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.01225 = \$ 0.98775.  
 $\$ 1500 \div \$ 0.98775 = \$ 1518.60+$ , Ans.

46. Bank discount of a \$ 1 note for 4 mo. 3 d. = \$ 0.0205.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.0205 = \$ 0.9795.  
 $\$ 293.85 \div \$ 0.9795 = \$ 300$ , face of note, Ans.

### Article 301.

47. Bank discount of a \$ 1 note for 63 d. = \$ 0.01225.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.01225 = \$ 0.98775.  
 $\$ 444.48\frac{1}{2} \div \$ 0.98775 = \$ 450$ , face of note, Ans.
48. Bank discount of a \$ 1 note for 6 mo. at 10% = \$ 0.05.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.05 = \$ 0.95.  
 $\$ 1520 \div \$ 0.95 = \$ 1600$ , face of note, Ans.
49. Bank discount of a \$ 1 note for 93 d. = \$ 0.0155.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.0155 = \$ 0.9845.  
 $\$ 828.95 \div \$ 0.9845 = \$ 842.00+$ , face of note, Ans.
50. Bank discount of a \$ 1 note for 8 m. 3 d. at  $7\frac{1}{2}\%$  = \$ 0.050625.  
Proceeds of a \$ 1 note = \$ 1 - \$ 0.050625 = \$ 0.949375.  
 $\$ 483.56 \div \$ 0.949375 = \$ 509.34$ , face of note, Ans.

## MISCELLANEOUS EXERCISES.

51. From Oct. 6, 1881, to Apr. 18, 1882, = 6 mo. 12 d. =  $\frac{1}{5}$  y.  
 $\$1 \times .05 \times \frac{1}{5} = \$0.026\frac{2}{3}$ ;  $\$1 + \$0.026\frac{2}{3} = \$1.026\frac{2}{3}$ .  
 $\$924 \div \$1.026\frac{2}{3} = \$900$ , present worth.  
 $\$924 - \$900 = \$24$ , discount, Ans.
52.  $\$1 \times .08 = \$0.08$ ;  $\$1 + \$0.08 = \$1.08$ .  
 $\$540 \div \$1.08 = \$500$ , present worth.  
 $\$500 \times .08 = \$40$ , interest, Ans.
53.  $\$1380 - \$1200 = \$180$ , interest.  
 $\$1200 \times .06 = \$72$ ;  $\$180 \div \$72 = 2\frac{1}{2} = 2$  y. 6 mo.  
 Oct. 15, 1880 - 2 y. 6 mo. = Apr. 15, 1878, Ans.
54.  $1\frac{1}{2}\%$  a month =  $1\frac{1}{2}\% \div 30 = \frac{1}{40}\%$  a day.  
 $\$1 \times \frac{1}{40} \times 63 = \$0.0315$ , bank discount of \$1 for 63 d.  
 $\$1 - \$0.0315 = \$0.9685$ , proceeds of \$1.  
 $\$5811 \div \$0.9685 = \$6000$ , face of note, Ans.
55. 4 mo. 3 d. after Aug. 22 = Dec. 25.  
 Since the note becomes due on a legal holiday, it must be paid one day earlier, or Dec. 24, Ans.
56.  $\$1 \times .06 \times 4 = \$0.24$ ;  $\$1 + \$0.24 = \$1.24$ .  
 $\$477.71 \div \$1.24 = \$385.25$ , present worth, Ans.
57.  $\$1 \times .07 \times \frac{7}{80} = \$0.014$ ;  $\$1 + \$0.014 = \$1.014$ .  
 $\$900 \div \$1.014 = \$887.57$ , present worth.  
 $\$900 - \$887.57 = \$12.43$ , discount, Ans.

58.  $\$1 \times .06 \times 1\frac{1}{2} = \$0.08$ ;  $\$1 + \$0.08 = \$1.08$ .  
 $\$576 \div \$1.08 = \$533.33$ , present worth.  
 $\$576 - \$533.33 = \$42.67$ , discount.  
 $\$576 \times .06 \times 1\frac{1}{2} = \$46.08$ , interest.

$$\$46.08 - \$42.67 = \$3.41, \text{ Ans.}$$

59. Term of discount, 93 days...Face of note, \$368.  

Interest for	60	"	.....	3.68
"	"	30	"	1.84
"	"	3	"	.184
			Bank discount,	\$5.70
			Proceeds,	\$362.30

} Ans.

60. 63 days after Jan. 31, 1882, = Apr. 4, 1882, Ans.

61.  $\$1 \times .07 \times 3 = \$0.21$ ;  $\$1 + \$0.21 = \$1.21$ .  
 $\$4235 \div \$1.21 = \$3500$ , present worth.  
 $\$3675 - \$3500 = \$175$ , loss, Ans.

62. Bank discount of \$1 for 33 d. at 6% = \$0.0055.  
Proceeds of \$1 = \$1 - \$0.0055 = \$0.9945.  
 $\$500 \div \$0.9945 = \$502.77$ , face of note, Ans.

63.  $\$750 \times .07\frac{1}{2} \times \frac{7}{4} = \$16.41$ , int. of \$750 for 3 mo. 15 d.  
 $\$750 + \$16.41 = \$766.41$ , amount of \$750.

Bank discount of \$1 for 48 d. at 7% = \$0.009 $\frac{1}{2}$ .

Proceeds of \$1 = \$1 - \$0.009 $\frac{1}{2}$  = \$0.990 $\frac{1}{2}$ .

$$\$766.41 \div \$0.990\frac{1}{2} = \$773.63, \text{ face of note, Ans.}$$

64. 1 A. = 43560 sq. ft.;  $43560 \times .05 = \$2178$ , sold for.  
Bank discount of \$1 for 6 mo. 3 d. at 5% = \$0.0254 $\frac{1}{2}$ .  
Bank discount of \$2178 =  $2178 \times \$0.0254\frac{1}{2} = \$55.36$ .  
Proceeds of \$2178 =  $\$2178 - \$55.36 = \$2122.64$ .  
 $\$2122.64 - \$400 = \$1722.64$ , profit, Ans.



**Article 314**

8.  $102\frac{1}{2}\% + \frac{1}{4}\% = 102\frac{3}{4}\%$ ;  $102\frac{3}{4}\%$  of \$2000 = \$2050, Ans.
9.  $113\frac{1}{2}\% + \frac{1}{8}\% = 113\frac{5}{8}\%$ ;  
 $113\frac{5}{8}\%$  of \$30000 = \$34087.50, Ans.
10.  $101\frac{1}{2}\%$  of \$1250 = \$1268.75, Ans.
12.  $\$100 \times 25 = \$2500$ , par value.  
 $\frac{1}{4}\%$  of \$2500 = \$3.125, brokerage.  
 $\$3206.25 - \$3.125 = \$3203.12\frac{1}{2}$ .  
 $\$3203.12\frac{1}{2} \div 25 = \$128.12\frac{1}{2}$ , Ans.
13. \$1 in gold = \$1.01 $\frac{1}{2}$  in currency.  
 $\$126.75 \div 1.01\frac{1}{2} = \$124.57\frac{1}{10}\frac{1}{7}$ , Ans.
14.  $\$100 \times 10 = \$1000$ , par value.  
 $\frac{1}{4}\%$  of \$1000 = \$2.50, the brokerage.  
 $\$1302.50 - \$2.50 = \$1300$ , the market value.  
 $\$1300 \div 10 = \$130$ , market value of 1 share, Ans.
16.  $105\frac{1}{4}\% + \frac{1}{4}\% = 106\%$ .  
 $\$2650 \div 1.06 = \$2500$ , par value.  
 $\$2500 \times .05 = \$125$ , yearly income, Ans.
17.  $86\% + \frac{1}{4}\% = 86\frac{1}{4}\%$ .  
 $\$6900 \div .86\frac{1}{4} = \$8000$ , par value.  
 $\$8000 \times .04\frac{1}{2} = \$360$ , yearly income, Ans.
18.  $105\frac{1}{4}\% + \frac{1}{4}\% = 106\%$ ;  $\$2650 \div 1.06 = \$2500$ , par value.  
 $\$2500 \times .06 = \$150$ , yearly income.  
 $104\frac{1}{4}\% + \frac{1}{4}\% = 104\frac{1}{2}\%$ ;  $\$3135 \div 1.04\frac{1}{2} = \$3000$ , par value.  
 $\$3000 \times .05 = \$150$ , yearly income.  
 Ans. Each yields the same income.

20.  $\$900 \div .04\frac{1}{2} = \$20000$ , par value of stock.  
 $\$20000 \times 1.05\frac{1}{2} = \$21100$ , amount to be invested, Ans.
21.  $\$1050 \div .07 = \$15000$ , par value of stock.  
 $\$15000 \times 1.09 = \$16350$ , amount to be invested, Ans.
22.  $\$2500 \div .05 = \$50000$ , par value of stock.  
 $\$50000 \times 1.09 = \$54500$ , amount to be invested, Ans.
24. The annual income of a share of 5% stock is \$5.  
 If the cost is \$110, the income is  $\frac{5}{110}$ , or  $\frac{1}{22}$ , or  $4\frac{1}{11}\%$  of the cost, Ans.
25. The annual income of a share of 6% stock is \$6.  
 If the cost is \$120, the income is  $\frac{6}{120}$ , or  $\frac{1}{20}$ , or 5% of the cost.  
 The annual income of a share of 5% stock is \$5.  
 If the cost is \$105, the income is  $\frac{5}{105}$ , or  $\frac{1}{21}$ , or  $4\frac{1}{21}\%$  of the cost.  
 $5\% - 4\frac{1}{21}\% = \frac{1}{21}\%$ .  
 Ans. Railroad 6's  $\frac{1}{21}\%$  greater.
26. The annual income of a share of 8% stock is \$8.  
 If the cost is \$125, the income is  $\frac{8}{125}$ , or  $6\frac{2}{5}\%$  of the cost, Ans.
28. A 6% stock yields \$6 on an investment of \$100.  
 If the \$6 is 7% of the investment,  $1\% = \frac{1}{7}$  of \$6.  
 $100\%$  of the investment =  $100 \times \frac{1}{7}$  of \$6, or \$85 $\frac{4}{7}$ , Ans.
29. A 8% stock yields \$8 on an investment of \$100.  
 If the \$8 is 6% of the investment,  $1\% = \frac{1}{6}$  of \$8.  
 $100\%$  of the investment =  $100 \times \frac{1}{6}$  of \$8, or \$133 $\frac{1}{3}$ , Ans.

### Article 323.

5.  $\$1164 \times .01 = \$11.64$ , premium.  
 $\$1164 + \$11.64 = \$1175.64$ , cost of the draft, Ans.

6.  $\$4000 \times .025 = \$100$ , discount.  
 $\$4000 - \$100 = \$3900$ , cost of the draft, Ans.
7.  $\$2517.70 \times .00\frac{1}{8} = \$3.14\frac{1}{8}$ , premium.  
 $\$2517.70 + \$3.14\frac{1}{8} = \$2520.84\frac{1}{8}$ , cost of the draft, Ans.
9.  $\$1 + \$0.00125 = \$1.00125$ , cost of \$1 of the draft.  
 $\$2520.84 \div \$1.00125 = \$2517.69+$ , face of the draft, Ans.
10.  $\$1 - \$0.025 = \$0.975$ , cost of \$1 of the draft.  
 $\$3900 \div \$0.975 = \$4000$ , face of the draft, Ans.
11.  $\$1 + \$0.01 = \$1.01$ , cost of \$1 of the draft.  
 $\$1175.64 \div \$1.01 = \$1164$ , face of the draft, Ans.
12.  $\$1 - \$0.00625 = \$0.99375$ , cost of \$1 of the draft.  
 $\$447.18\frac{1}{2} \div \$0.99375 = \$450$ , face of the draft, Ans.
14.  $\$1 \times .995 = \$0.995$ , cost of \$1 at sight at  $\frac{1}{2}\%$  discount.  
 $\$0.995 \times 1500 = \$1492.50$ , cost of \$1500 " "  
 $\$1500 \times 0.01225 = \$18.375$ , discount.  
 $\$1492.50 - \$18.375 = \$1474.12\frac{1}{2}$ , cost of the draft, Ans.
15.  $\$1 \times 1.01 = \$1.01$ , cost of \$1 at sight at 1% premium.  
 $\$1.01 \times 3000 = \$3030$ , cost of \$3000.  
 $\$3000 \times 0.0105 = \$31.50$ , discount.  
 $\$3030 - \$31.50 = \$2998.50$ , cost of the draft, Ans.
17.  $\$1 \times 0.0055 = \$0.0055$ , int. of \$1 for 33 days.  
 $\$1 - \$0.0055 = \$0.9945$ , cost of \$1 of exchange.  
 $\$3978 \div \$0.9945 = \$4000$ , face of the draft, Ans.

18.  $\$1 - \$0.005 = \$0.995$ , cost of  $\$1$  at sight.  
 $\$1 \times 0.01225 = \$0.01225$ , int. of  $\$1$  for 63 days.  
 $\$0.995 - \$0.01225 = \$0.98275$ , cost of  $\$1$  of exchange.  
 $\$491.37\frac{1}{2} \div 0.98275 = \$500$ , face of the draft, Ans.
19.  $\$1 + \$0.01 = \$1.01$ , cost of  $\$1$  at sight.  
 $\$1 \times 0.0055 = \$0.0055$ , int. of  $\$1$  for 33 days.  
 $\$1.01 - \$0.0055 = \$1.0045$ , cost of  $\$1$  of exchange.  
 $\$2998.50 \div 1.0045 = \$2985.067+$ , face of the draft, Ans.

**Article 330.**

21.  $\$777.94 \div 4.85 = \pounds 160.4 = \pounds 160 \text{ 8s.}$ , Ans.
22.  $\pounds 1320 \text{ 10s.} = \pounds 1320.5$ .  
 $\$4.87\frac{1}{2} \times 1320.5 = \$6437.43\frac{3}{4}$ , Ans.
23.  $\$1 = 5.15 \text{ francs}$ ;  $2380 \div 5.15 = \$462.13\frac{41}{103}$ , Ans.
24.  $\$1 = 5.19 \text{ francs}$ ;  $1500 \div 5.19 = \$289.01\frac{177}{193}$ , Ans.
25.  $\$1 = 5.20 \text{ francs}$ ;  $3195 \times 5.20 \text{ f.} = 16614 \text{ f.}$ , Ans.
26.  $\frac{1304}{4} \times \$0.95 = \$309.70$ , Ans.
27. Exchange =  $\$0.95\frac{1}{2}$  per 4 reichsmarks.  
 $\$0.95\frac{1}{2} \div 4 = \$0.23\frac{7}{8}$  per 1 reichsmark.  
 $\$1420.20 \div \$0.23\frac{7}{8} = 5948\frac{22}{191}$  reichsmarks, Ans.
28.  $\pounds 1254 \text{ 15s. 6d.} = \pounds 1254.775$ ;  
 $1254.775 \times \$4.87\frac{1}{2} = \$6117.03$ , Ans.
29.  $1042.50 \times 5.21\frac{1}{2} \text{ francs} = 5434.03\frac{1}{2} \text{ francs}$ , Ans.

**Article 334.**

7. Jan. 3 + 30 days = Feb. 2, \$ 150 is due.

Jan. 15 + 3 mo. = Apr. 15, or 72 d. after Feb. 2, \$ 125 is due.

Feb. 1 + 60 d. = Apr. 2, or 59 d. after Feb. 2, \$ 200 is due.

150

 $125 \times 72 \text{ days} = 9000 \text{ days.}$  $200 \times 59 \text{ " } = 11800 \text{ "}$  $475 \qquad \qquad ) 20800 \text{ "}$ 

44 days.

Feb. 2 + 44 d. = Mar. 18, average time, Ans.

- 8.
- $40 \times 3 \text{ mo.} = 120 \text{ mo.}$

 $60 \times 5 \text{ " } = 300 \text{ "}$  $100 \qquad \qquad ) 420 \text{ "}$  $4\frac{1}{2} \text{ mo., or 4 mo. 6 d.}$ 

May 7 + 4 mo. 6 d. = Sept. 13, average time, Ans.

9. 250

 $350 \times 2 = 700 \text{ mo.}$  $400 \times 6 = 2400 \text{ "}$  $1000 \qquad \qquad ) 3100 \text{ "}$  $3\frac{1}{10} \text{ mo., or 3 mo. 3 d., average time, Ans.}$ 

- 10.
- $170 \times 40 \text{ days} = 6800 \text{ days.}$

 $200 \times 60 \text{ " } = 12000 \text{ "}$  $150 \times 90 \text{ " } = 13500 \text{ "}$  $520 \qquad \qquad ) 32300 \text{ "}$ 

62 days.

May 16, 1881, + 62 days = July 17, 1881, equated time, Ans.

11. Apr. 15, \$ 200 is due.

May 1, or 16 days after Apr. 15, \$ 311 is due.

June 1, or 47 " " " \$ 160 "

$$\begin{array}{r}
 200 \\
 311 \times 16 = 4976 \text{ days.} \\
 160 \times 47 = 7520 \text{ " } \\
 \hline
 671 \quad ) 12496 \text{ " } \\
 \hline
 19 \text{ days.}
 \end{array}$$

Apr. 15 + 19 days = May 4, average time, Ans.

12.  $800 \times 30 \text{ days} = 24000 \text{ days.}$

$500 \times 60 \text{ " } = 30000 \text{ " }$

$120 \times 90 \text{ " } = 10800 \text{ " }$

$1420 \quad ) 64800 \text{ " }$

46 days, average time, Ans.

### Article 335.

13. July 5, \$ 600 is due.

July 15, or 10 days after July 5, \$ 400 is due.

Aug. 10, or 36 " " " \$ 500 "

$$\begin{array}{r}
 600 \\
 400 \times 10 \text{ days} = 4000 \text{ days.} \\
 500 \times 36 \text{ " } = 18000 \text{ " } \\
 \hline
 1500 \quad ) 22000 \text{ " } \\
 \hline
 15 \text{ days.}
 \end{array}$$

July 5, 1881, + 15 d. + 60 d. = Sept. 18, 1881, average time, Ans.

14. Sept. 9, \$ 140 is due.

Oct. 9, or 30 days after Sept. 9, \$ 160 is due.

Nov. 6, or 58 " " " \$ 200 "

140

$160 \times 30 \text{ days} = 4800 \text{ days.}$

$200 \times 58 \text{ " } = 11600 \text{ "}$

$\begin{array}{r} 500 \\ \hline \end{array} \quad ) \overline{16400} \text{ "}$

33 days.

Sept. 9, 1880, + 33 d. + 4 m. = Feb. 12, 1881, average time, Ans.

15. Apr. 11, \$ 450 is due.

Apr. 30, or 19 days after Apr. 11, \$ 600 is due.

May 16, or 35 days after Apr. 11, \$ 400 is due.

450

$600 \times 19 \text{ days} = 11400 \text{ days.}$

$400 \times 35 \text{ " } = 14000 \text{ "}$

$\begin{array}{r} 1450 \\ \hline \end{array} \quad ) \overline{25400} \text{ "}$

$17\frac{1}{2} = 18 \text{ days.}$

Apr. 11, 1881, + 18 d. + 63 d. = July 1, 1881, average date, Ans.

16. July 2, \$ 225 is due.

Aug. 4, or 33 days after July 2, \$ 360 is due.

Sept. 10, or 70 " " " \$ 500 "

Sept. 24, or 84 " " " \$ 320 "

225

$360 \times 33 \text{ days} = 11800 \text{ days.}$

$500 \times 70 \text{ " } = 35000 \text{ "}$

$320 \times 84 \text{ " } = 26880 \text{ "}$

$\begin{array}{r} 1405 \\ \hline \end{array} \quad ) \overline{73680} \text{ "}$

52 days.

July 2, 1881, + 52 d. + 6 mo. = Feb. 23, 1882, average time, Ans.

**Article 336.**

$$17. \frac{2\frac{1}{2}}{3\frac{3}{4}} = \frac{\cancel{5}}{\cancel{2}} \times \frac{\cancel{4}^2}{\cancel{12}_3} = \frac{2}{3} \text{ of } 100\% = 66\frac{2}{3}\%, \text{ Ans.}$$

$$18. \frac{\overset{337}{\cancel{2859}}}{\underset{\cancel{5}}{\cancel{35}}} \times \overset{20}{\cancel{100}} = \$6740, \text{ Ans.}$$

$$19. \frac{3}{4} \text{ of } \$1200 = \$900; 17\% \text{ of } \$900 = \$153, \text{ gain.}$$

$$\$900 + \$153 = \$1053, \text{ Ans.}$$

$$20. \$360 = 80\%; \frac{\overset{90}{\cancel{360}}}{\underset{\cancel{4}}{\cancel{80}}} \times \overset{5}{\cancel{100}} = \$450, \text{ value.}$$

$$\$450 \times 1.30 = \$585, \text{ Ans.}$$

$$21. 50 \times 10 = 500 \text{ words; } 500 - 75 = 425, \text{ spelled correctly.}$$

$$\frac{425}{500} = \frac{17}{20} \text{ of } 100\% = 85\%, \text{ Ans.}$$

$$22. \text{ The year } 1880 = 366 \text{ d.; June } 15 = 167 \text{ d. from Jan. } 1.$$

$$\frac{167}{366} \text{ of } 100\% = 45\frac{11}{18}\%, \text{ Ans.}$$

$$23. \$232.75 = 95\%; \frac{\$232.75}{95} \times 100 = \$245.00.$$

$$\$245.00 - \$232.75 = \$12.25, \text{ discount, Ans.}$$





30. The present worth of \$1550 due in 30 days is  $\$1550 \div \$1.005 = \$1542.29$ .

$$\$1550 - \$1542.29 = \$7.71, \text{ true discount.}$$

$$5\% \text{ of } \$1550 = \$77.50, \text{ the discount offered for cash.}$$

$$\$77.50 - \$7.71 = \$69.79, \text{ difference, Ans.}$$

31.  $\$6415.50 \times .05 \times 3\frac{1}{2} = \$1122.71\frac{1}{2}$ , simple interest.

$$\$1 \times .05 \times 3\frac{1}{2} = \$0.17\frac{1}{2}; \$1 + \$0.17\frac{1}{2} = \$1.17\frac{1}{2}.$$

$$\$6415.50 \div \$1.17\frac{1}{2} = \$5460, \text{ present worth.}$$

$$\$6415.50 - \$5460 = \$955.50, \text{ discount.}$$

$$\$1122.71\frac{1}{2} - \$955.50 = \$167.21\frac{1}{2}, \text{ Ans.}$$

32.  $\$1300 \times .07 \times 4 = \$364$ , simple interest.

Principal for 1st year . . . . .	\$1300.00
----------------------------------	-----------

Interest " " . . . . .	91.00
------------------------	-------

Principal for 2d year . . . . .	\$1391.00
---------------------------------	-----------

Interest " " . . . . .	97.37
------------------------	-------

Principal for 3d year . . . . .	\$1488.37
---------------------------------	-----------

Interest " " . . . . .	104.19
------------------------	--------

Principal for 4th year . . . . .	\$1592.56
----------------------------------	-----------

Interest " " . . . . .	111.48
------------------------	--------

Compound amount for 4 years . . . . .	\$1704.04
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Given principal . . . . .	1300.00
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Compound interest for four years . . . . .	\$404.04
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$$\$404.04 - \$364 = \$40.04, \text{ Ans.}$$

## 33.

Principal . . . . .	\$2000.00
---------------------	-----------

Int. from Jan. 1, 1880, to July 1, 1880, 6 m. . . . .	60.00
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Amount . . . . .	\$2060.00
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1st payment . . . . .	500.00
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New principal . . . . .	\$1560.00
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Int. from July 1, 1880, to Jan. 1, 1882, 1y. 6m. . . . .	140.40
--	--------

Amount due Jan. 1, 1882 . . . . .	Ans. \$1700.40
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34. The annual income of a share of 4% stock is \$4.

If the cost is \$92, the income is  $\frac{4}{92}$ , or  $\frac{1}{23}$ , or  $4\frac{2}{23}\%$  of the cost.

The annual income of a share of 5% stock is \$5.

If the cost is \$110, the income is  $\frac{5}{110}$ , or  $\frac{1}{22}$ , or  $4\frac{5}{11}\%$  of the cost.

$$4\frac{5}{11}\% - 4\frac{2}{23}\% = \frac{1}{208}.$$

$$\$82.50 = \frac{1}{506}; \quad \frac{506}{506} = 506 \times \$82.50 = \$41745, \text{ Ans.}$$

35.  $\$26250 \div .87\frac{1}{2} = \$30000$ , face of bonds.

$\$30000 \times .91 = \$27300$ , proceeds of sale.

$$\$27300 - \$26250 = \$1050, \text{ gain, Ans.}$$

36.  $\$9080 \div .85\frac{1}{2} = \$10666\frac{2}{3}$ , par value.

$\$10666\frac{2}{3} \times .03 = \$320$ , yearly income.

$\$9800 \div 1.22\frac{1}{2} = \$8000$ , par value.

$\$8000 \div .05 = \$400$ , yearly income.

$$\$400 - \$320 = \$80, \text{ Ans.}$$

37.  $100 \times 50 \text{ days} = 5000 \text{ days.}$

$$130 \times 40 \text{ " } = 5200 \text{ "}$$

$$230 \times 140 \text{ " } = 32200 \text{ "}$$

$$\frac{460}{92\frac{2}{3}} = 92 \text{ days, Ans.}$$

### 38.

$\$2660 \times .0105 = \$27.93$ , int. of \$2660 for 63 d. at 6%.

$\$2570.89 + \$27.93 = \$2598.82$ , cost of \$2660 at sight.

$\$2598.82 \div \$2660 = 97\frac{7}{10}\%$  of face of draft.

$$100\% - 97\frac{7}{10}\% = 2\frac{3}{10}\%, \text{ discount, Ans.}$$

## 39.

Principal . . . . .	\$ 500.00
Int. from Oct. 8, 1880, to Nov. 4, 1881, 1 y. 27 d. .	32.25
Int. from Nov. 4, 1881, to Jan. 30, 1882, 2 m. 26 d.	7.17
Amount . . . . .	<u>\$ 539.42</u>
1st payment, less than interest due . . . . .	\$ 30
2d " . . . . .	250
New principal . . . . .	<u>\$ 259.42</u>
Int. from Jan. 30, 1882, to July 1, 1882, 5 m. 1 d. .	6.53
Amount due July 1, 1882 . . . . .	Ans. <u>\$ 265.95</u>

40.  $800 \times 4 \text{ mo.} = 3200 \text{ months' credit due me.}$   
 $\frac{100}{200} \times 2 \text{ " } = \frac{200}{600} \text{ " " used.}$   
 $\frac{200}{500} \times 3 \text{ " } = \frac{600}{2400} \text{ " " "}$   
 $\frac{500}{4\frac{1}{2}} \text{ " " still due me.}$   
 $\frac{2400}{4\frac{1}{2}} \text{ " " due on \$ 500.}$

$$4\frac{1}{2} \text{ mo.} - 4 \text{ mo.} = \frac{1}{2} \text{ mo.} = 24 \text{ days, Ans.}$$

## Article 348.

$$27. \quad 14 : 7 = 18 : 9 \quad \frac{7 \times 18}{14} = 9, \text{ Ans.}$$

$$28. \quad 5 : 20 = 15 : 60 \quad \frac{5 \times 60}{20} = 15, \text{ Ans.}$$

$$29. \quad 40 : 8 = 65 : 13 \quad \frac{8 \times 65}{13} = 40, \text{ Ans.}$$

$$30. \quad 648 : 243 = 24 : 9 \quad \frac{243 \times 24}{648} = 9, \text{ Ans.}$$

$$21. \frac{1}{2} : \frac{1}{3} :: 4 : x \quad \frac{\frac{1}{2} \times 3}{\frac{1}{3} \times 4} = \frac{1}{3} \text{ Ans.}$$

$$22. 45 : 24 :: 15 : x \quad \frac{45 \times 15}{24} = 3 \text{ Ans.}$$

$$23. 30 : 9 :: 60 : 18 \quad \frac{9 \times 60}{30} = 18 \text{ Ans.}$$

$$24. 5 : \frac{1}{2} :: \$75.00 : \$7.50 \quad \frac{5 \times 2 \times 7.50}{1} = \$75 \text{ Ans.}$$

### Article 349.

$$26. 12 : 30 :: \$51 : \$x \quad \frac{30 \times 51}{12} = \$127.50 \text{ Ans.}$$

$$27. 183 : 61 = \$273 : \$x \quad \frac{61 \times 273}{183} = \$91 \text{ Ans.}$$

$$28. 10 : 48 = 30 : x \quad \frac{48 \times 30}{10} = 90 \text{ men, Ans.}$$

$$29. 20 : 24 = 15 : x \quad \frac{24 \times 15}{20} = 18 \text{ days, Ans.}$$

## Article 350.

$$40. 15 : 79 :: \$120 : \$x \quad \frac{79 \times \overset{8}{120}}{15} = \$632, \text{ Ans.}$$

$$41. 7 : 27 :: \$5.58 : \$x \quad \frac{27 \times \overset{84}{5.58}}{7} = \$22.68, \text{ Ans.}$$

$$42. 11 : 47 :: 319 : x \quad \frac{47 \times \overset{29}{319}}{11} = 1363 \text{ miles, Ans.}$$

$$43. 36 : 27 :: 12 : x \quad \frac{\overset{9}{27} \times 12}{\underset{3}{36}} = 9 \text{ days, Ans.}$$

$$44. 98 : 7 :: \$441 : \$x \quad \frac{7 \times \overset{63}{441}}{\underset{2}{98}} = \$31\frac{1}{2}, \text{ Ans.}$$

$$45. 24 : 18 :: 15 : x \quad \frac{\overset{3}{18} \times 15}{\underset{4}{24}} = 11\frac{1}{4} \text{ days, Ans.}$$

$$46. 2700 : 2100 :: 9 : x \quad \frac{\overset{7}{2100} \times 9}{\underset{9}{2700}} = 7 \text{ mo., Ans.}$$

$$47. 4\frac{1}{2} : 19\frac{1}{2} :: \$27 : \$x \quad \frac{8 \times 39 \times 23}{39 \times 2 \times 8} = \$11\frac{1}{2}, \text{ Ans.}$$

$$48. 54 : 74 :: 30 : x \quad \frac{74 \times \overset{5}{30}}{\underset{9}{54}} = 41\frac{1}{3} \text{ days, Ans.}$$

$$49. 2\frac{3}{4} : 3\frac{1}{2} :: 6336 : x \quad \frac{3 \times 13 \times \overset{198}{6336}}{\underset{8 \times 4}{8 \times 4}} = 7722, \text{ Ans.}$$

$$50. 3\frac{1}{2} : 4\frac{1}{2} :: \$27.50 : x \quad \frac{4 \times 37 \times \overset{2.75}{\underset{3}{5.50}}}{\underset{2}{15 \times 8}} = \$33.91\frac{1}{3}, \text{ Ans.}$$

$$51. 108 : 72 :: 288 : x \quad \frac{\overset{24}{72} \times \overset{8}{288}}{\underset{3}{108}} = 192 \text{ men.}$$

288 men — 192 men = 96 men, Ans.

$$52. 3\frac{1}{2} : 12\frac{1}{2} :: \$11.37\frac{1}{2} : x \quad \frac{\overset{3.25}{2} \times 97 \times \overset{22.75}{22.75}}{\underset{7 \times 8 \times 2}{7 \times 8 \times 2}} = \$39.40\frac{1}{8}, \text{ Ans.}$$

### Article 352.

$$54. \begin{matrix} 3 : 2 \\ 2 : 6 \end{matrix} \} :: 108 : x \quad \frac{\overset{2}{2} \times \underset{3}{6} \times 108}{\underset{2}{3} \times \underset{2}{2}} = 216, \text{ Ans.}$$

$$55. \begin{matrix} \$500 : \$250 \\ \$175 : \$360 \end{matrix} \} :: 7 : x \quad \frac{\overset{72}{250} \times \overset{360}{360} \times 7}{\underset{2}{500} \times \underset{35}{175}} = 7\frac{1}{2} \text{ y., Ans.}$$

$$56. \begin{matrix} 76 : 114 \\ 9 : 6 \end{matrix} \} :: 24 : x \quad \frac{\overset{2}{38} \times \overset{2}{6} \times \overset{6}{24}}{\underset{19}{76} \times \underset{3}{9}} = 24 \text{ men, Ans.}$$

$$57. \quad \left. \begin{array}{l} 5 : 10 \\ 10\frac{1}{2} : 14 \end{array} \right\} :: 6 : x \quad \frac{10^2 \times 14^2 \times 6^2 \times 2}{5 \times 21^3} = 16 \text{ acres, Ans.}$$

$$58. \quad \left. \begin{array}{l} 28 : 15 \\ 7\frac{1}{2} : 4 \end{array} \right\} :: 16 : x \quad \frac{15 \times 4 \times 16 \times 2}{28 \times 15^2} = 4\frac{1}{2}, \text{ Ans.}$$

$$59. \quad \left. \begin{array}{l} 10 : 15 \\ 8 : 7 \end{array} \right\} :: \$8 : x \quad \frac{15^3 \times 7 \times 8}{10 \times 8^2} = \$10\frac{1}{2}, \text{ Ans.}$$

$$60. \quad \left. \begin{array}{l} 15 : 20 \\ 9 : 12 \end{array} \right\} :: 117 : x \quad \frac{20^4 \times 12^4 \times 117^{13}}{15^3 \times 9} = 208 \text{ miles, Ans.}$$

$$61. \quad \left. \begin{array}{l} 96 : 150 \\ 1 : 6 \end{array} \right\} :: 192 : x \quad \frac{150 \times 6 \times 192^2}{96 \times 1^2} = 1800 \text{ tons, Ans.}$$

$$62. \quad \left. \begin{array}{l} 250 : 400 \\ 10 : 12 \end{array} \right\} :: 9 : x \quad \frac{40^4 \times 12 \times 9}{250 \times 10^3} = 17\frac{7}{25} \text{ days, Ans.}$$

$$63. \quad \left. \begin{array}{l} 6 : 8 \\ 84 : 200 \end{array} \right\} :: 16 : x \quad \frac{8^2 \times 200 \times 16}{8 \times 84^3} = 50\frac{4}{9} \text{ weeks, Ans.}$$

$$64. \quad \left. \begin{array}{l} 6 : 12 \\ 4 : 9 \end{array} \right\} :: 16 : x \quad \frac{8^3 \times 9 \times 16^8}{4 \times 8^2} = 72 \text{ acres, Ans.}$$

$$65. \quad \left. \begin{array}{l} 20 : 100 \\ 6 : 4 \end{array} \right\} :: 180 : x \quad \frac{5^5 \times 4 \times 180^{30}}{20 \times 6^3} = 600 \text{ bricks, Ans.}$$



$$66. \left. \begin{array}{l} 34 : 8 \\ 6 : 36 \\ 9 : 12 \end{array} \right\} :: 90 : x \quad \frac{\overset{4}{8} \times \overset{6}{36} \times \overset{10}{12} \times 90}{\underset{17}{34} \times 6 \times 9} = 169\frac{7}{17} \text{ cd., Ans.}$$

$$67. \left. \begin{array}{l} 30 : 12 \\ 30 : 300 \\ 6 : 8 \\ 3 : 6 \\ 8 : 12 \end{array} \right\} :: 15 : x \quad \frac{\overset{2}{12} \times \overset{10}{300} \times \overset{8}{8} \times \overset{8}{6} \times 12 \times 15}{\underset{2}{30} \times \overset{8}{30} \times \overset{8}{6} \times \overset{8}{8} \times 8} = 240 \text{ days, Ans.}$$

$$63. \left. \begin{array}{l} 20 : 12 \\ 2\frac{1}{2} : 3 \end{array} \right\} :: \$4 : \$x \quad \frac{12 \times 3 \times 4}{\underset{5}{20} \times 2\frac{1}{2}} = \$2.88, \text{ Ans.}$$

$$69. \left. \begin{array}{l} 67\frac{1}{2} : 450 \\ 18 : 8 \\ 3\frac{3}{4} : 4\frac{1}{2} \end{array} \right\} :: 2\frac{1}{2} : x \quad \frac{\overset{4}{2} \times \overset{8}{8} \times \overset{8}{9} \times \overset{5}{5} \times \overset{8}{6} \times \overset{10}{450}}{\underset{8}{18} \times \underset{2}{18} \times \underset{2}{2} \times \underset{2}{2} \times 23} = 8\frac{1}{2} \text{ ft., Ans.}$$

$$70. \left. \begin{array}{l} 48 : 52 \\ 8 : 14 \end{array} \right\} :: \$1200 : \$x \quad \frac{\overset{13}{52} \times \overset{7}{14} \times \overset{25}{1200}}{\underset{2}{48} \times \underset{2}{8}} = \$2275.$$

$$\$2275 \div 12 = \$189\frac{7}{12}, \text{ per month, Ans.}$$

### Article 356.

$$7. \$6000 + \$9000 + \$5000 = \$20000, \text{ the capital.}$$

$$\text{A's stock} = \frac{6000}{20000} = \frac{3}{10}; \frac{3}{10} \text{ of } \$1680 = \$504, \text{ A's gain.}$$

$$\text{B's " } = \frac{9000}{20000} = \frac{9}{20}; \frac{9}{20} \text{ of } \$1680 = \$756, \text{ B's gain.}$$

$$\text{C's " } = \frac{5000}{20000} = \frac{1}{4}; \frac{1}{4} \text{ of } \$1680 = \$420, \text{ C's gain.}$$

**Article 357.**

8. \$1280 + \$1760 + \$1920 = \$4960, the capital.

$$\text{A's stock} = \frac{1280}{4960} = \frac{8}{31}; \frac{8}{31} \text{ of } \$2790 = \$720, \text{ A's gain.}$$

$$\text{B's " } = \frac{1760}{4960} = \frac{11}{31}; \frac{11}{31} \text{ of } \$2790 = \$990, \text{ B's "}$$

$$\text{C's " } = \frac{1920}{4960} = \frac{12}{31}; \frac{12}{31} \text{ of } \$2790 = \$1080, \text{ C's "}$$

9. \$1750 + \$2100 + \$2650 = \$6500, the capital.

$$\text{A's stock} = \frac{1750}{6500} = \frac{7}{26}; \frac{7}{26} \text{ of } \$4225 = \$1137.50, \text{ A's share.}$$

$$\text{B's " } = \frac{2100}{6500} = \frac{21}{65}; \frac{21}{65} \text{ of } \$4225 = \$1365, \text{ B's share.}$$

$$\text{C's " } = \frac{2650}{6500} = \frac{53}{130}; \frac{53}{130} \text{ of } \$4225 = \$1722.50, \text{ C's share.}$$

10. \$1200 + \$1600 = \$2800, the capital.

$$\text{Hall's stock} = \frac{1200}{2800} = \frac{3}{7}; \frac{3}{7} \text{ of } \$728 = \$312, \text{ Hall's gain.}$$

$$\text{Bishop's " } = \frac{1600}{2800} = \frac{4}{7}; \frac{4}{7} \text{ of } \$728 = \$416, \text{ Bishop's gain.}$$

11. 400 bbl. + 600 bbl. + 400 bbl. = 1400 bbl.

$$\text{B's stock} = \frac{400}{1400} = \frac{2}{7}; \frac{2}{7} \text{ of } 360 \text{ bbl.} = 102\frac{2}{7} \text{ bbl., B's loss.}$$

$$\text{C's " } = \frac{600}{1400} = \frac{3}{7}; \frac{3}{7} \text{ of } 360 \text{ " } = 154\frac{2}{7} \text{ " C's "}$$

$$\text{D's " } = \frac{400}{1400} = \frac{2}{7}; \frac{2}{7} \text{ of } 360 \text{ " } = 102\frac{2}{7} \text{ " D's "}$$

12. 8 horses + 6 horses + 10 horses = 24 horses.

A's stock =  $\frac{8}{24} = \frac{1}{3}$ ;  $\frac{1}{3}$  of \$ 300 = \$ 100, A's share.

B's " =  $\frac{6}{24} = \frac{1}{4}$ ;  $\frac{1}{4}$  of \$ 300 = \$ 75, B's share.

C's " =  $\frac{10}{24} = \frac{5}{12}$ ;  $\frac{5}{12}$  of \$ 300 = \$ 125, C's share.

13 \$ 1400 + \$ 600 = \$ 2000, A's and B's stock.

\$ 180 - \$ 60 = \$ 120, A's and B's gain.

A's stock =  $\frac{1400}{2000} = \frac{7}{10}$ ;  $\frac{7}{10}$  of \$ 120 = \$ 84, A's gain.

B's " =  $\frac{600}{2000} = \frac{3}{10}$ ;  $\frac{3}{10}$  of \$ 120 = \$ 36, B's "

C's gain =  $\frac{60}{180}$  of whole gain =  $\frac{1}{3}$  of whole gain.

C's stock =  $\frac{1}{3}$  of whole stock.

$\frac{2}{3}$  of stock = \$ 2000;  $\frac{1}{3} = \frac{1}{2}$  of \$ 2000 = \$ 1000, C's stock.

125 bbl. cost \$ 1000.

1 bbl. cost \$ 1000  $\div$  125 = \$ 8.

### Article 358.

15. A's \$ 750 for 4 mo. = \$ 3000 for 1 mo.

B's \$ 850 " 8 " = 6800 "

C's \$ 800 " 12 " = 9600 "

The entire stock is the same as \$ 19400 "

$\frac{3000}{19400} = \frac{15}{97}$ ;  $\frac{15}{97}$  of \$ 640 = \$ 98.9688, A's loss.

$\frac{6800}{19400} = \frac{34}{97}$ ;  $\frac{34}{97}$  of \$ 640 = \$ 224.3288, B's "

$\frac{9600}{19400} = \frac{48}{97}$ ;  $\frac{48}{97}$  of \$ 640 = \$ 316.7019, C's "

16. A's \$5000 for 8 mo. = \$40000 for 1 mo.

B's \$4000 " 12 " = \$48000 "

C's \$3000 " 15 " = \$45000 "

The entire stock is the same as \$133000 "

$$\frac{40000}{133000} = \frac{40}{133}; \frac{40}{133} \text{ of } \$1330 = \$400, \text{ A pays.}$$

$$\frac{48000}{133000} = \frac{48}{133}; \frac{48}{133} \text{ of } \$1330 = \$480, \text{ B "}$$

$$\frac{45000}{133000} = \frac{45}{133}; \frac{45}{133} \text{ of } \$1330 = \$450, \text{ C "}$$

17. A's 30 horses for 33 days = 990 horses for 1 day.

B's 21 " 42 " = 882 " " "

The entire stock is the same as 1872 " " "

$$\frac{990}{1872} = \frac{55}{104}; \frac{55}{104} \text{ of } \$46.80 = \$24.75, \text{ A pays.}$$

$$\frac{882}{1872} = \frac{49}{104}; \frac{49}{104} \text{ of } \$46.80 = \$22.05, \text{ B "}$$

18. A's \$500 for 9 mo. = \$4500 for 1 mo.

B's \$700 " 12 " = \$8400 "

C's \$400 " 15 " = \$6000 "

The entire stock is the same as \$18900 "

$$\frac{4500}{18900} = \frac{5}{21}; \frac{5}{21} \text{ of } \$300 = \$71\frac{2}{3}, \text{ A's loss.}$$

$$\frac{8400}{18900} = \frac{4}{9}; \frac{4}{9} \text{ of } \$300 = \$133\frac{1}{3}, \text{ B's "}$$

$$\frac{6000}{18900} = \frac{20}{63}; \frac{20}{63} \text{ of } \$300 = \$95\frac{1}{3}, \text{ C's "}$$

19. A's \$ 6000 for 6 mo. = \$ 36000 for 1 mo.

A's \$ 10000 " =  $\frac{60000}{10000}$  "

A's entire stock is the same as  $\frac{96000}{10000}$  "

B's \$ 12000 for 8 mo. = \$ 96000 "

B's \$ 6000 " 4 " =  $\frac{24000}{6000}$  "

B's entire stock is the same as  $\frac{120000}{6000}$  "

\$ 96000 + \$ 120000 = \$ 216000, the capital.

$\frac{96000}{216000} = \frac{4}{9}$ ;  $\frac{4}{9}$  of \$ 2160 = \$ 960, A's gain.

$\frac{120000}{216000} = \frac{5}{9}$ ;  $\frac{5}{9}$  of \$ 2160 = \$ 1200, B's "

20. A's \$ 500 for 4 mo. = \$ 2000 for 1 mo.

A's \$ 800 " 8 " =  $\frac{6400}{800}$  "

A's entire stock is the same as  $\frac{8400}{800}$  "

B's \$ 400 for 6 mo. = \$ 2400 for 1 mo.

B's \$ 900 " =  $\frac{5400}{900}$  "

B's entire stock is the same as  $\frac{7800}{900}$  "

\$ 8400 + \$ 7800 = \$ 16200, the capital.

$\frac{8400}{16200} = \frac{42}{81}$ ;  $\frac{42}{81}$  of \$ 2400 = \$ 1244 $\frac{2}{3}$ , A's gain.

$\frac{7800}{16200} = \frac{39}{81}$ ;  $\frac{39}{81}$  of \$ 2400 = \$ 1155 $\frac{1}{3}$ , B's "

21. Wood's \$ 6000 for 12 mo. = \$ 72000 for 1 mo.

Furbush's \$ 5000 for 10 mo. =  $\frac{50000}{10000}$  "

Wood's and Furbush's stock =  $\frac{122000}{10000}$  "

Interest of \$ 4000 for 6 mo. at 6% = \$ 120.

$\frac{1200}{2}$  or \$ 600, + \$ 120 = \$ 720, Davis's share of profits.

\$ 3160 - \$ 720 = \$ 2440.

$\frac{72000}{122000} = \frac{36}{61}$ ;  $\frac{36}{61}$  of \$ 2440 = \$ 1440, Wood's share of profits.

$\frac{50000}{122000} = \frac{25}{61}$ ;  $\frac{25}{61}$  of \$ 2440 = \$ 1000, Furbush's " " "

22. A's \$ 2000 for 7 mo. = \$ 14000 for 1 mo.

A's \$ 6000 " 5 " = 30000 "

A's entire stock = \$ 44000 "

B's \$ 3000 for 9 " = \$ 27000 "

B's \$ 2000 " 3 " = 6000 "

B's entire stock = \$ 33000 "

C's \$ 5000 for 8 " = \$ 40000 "

\$ 44000 + \$ 33000 + \$ 40000 = \$ 117000, entire stock for 1 mo.

$\frac{44000}{117000} = \frac{44}{117}$ ;  $\frac{44}{117}$  of \$ 5850 = \$ 2200, A's gain.

$\frac{33000}{117000} = \frac{33}{117}$ ;  $\frac{33}{117}$  of \$ 5850 = \$ 1650, B's "

$\frac{40000}{117000} = \frac{40}{117}$ ;  $\frac{40}{117}$  of \$ 5850 = \$ 2000, C's "

### Article 363.

8. 529.	12. 15 $\frac{1}{2}$ .	16. 0.003375.
9. 4096.	13. 12.96.	17. 12.25.
10. 28561.	14. 15625.	18. 203 $\frac{1}{8}$ .
11. $\frac{9}{16}$ .	15. 161051.	19. 0.000343.

### Article 375.

26. 92'16 ( 96, Ans.	27. 2'72'25 ( 165, Ans.
81	1
186 $\overline{1116}$	26 $\overline{172}$
1116	156
	325 $\overline{1625}$
	1625

28.  $18'23'29$  ( 427, Ans.

$$\begin{array}{r}
 16 \\
 82 \overline{) 223} \\
 \underline{164} \\
 847 \overline{) 5929} \\
 \underline{5929}
 \end{array}$$

29.  $71'74'09$  ( 847, Ans.

$$\begin{array}{r}
 64 \\
 164 \overline{) 774} \\
 \underline{656} \\
 1687 \overline{) 11809} \\
 \underline{11809}
 \end{array}$$

30.  $94'86'76$  ( 974, Ans.

$$\begin{array}{r}
 81 \\
 187 \overline{) 1386} \\
 \underline{1309} \\
 1944 \overline{) 7776} \\
 \underline{7776}
 \end{array}$$

31.  $6'70'81$  ( 2.59, Ans.

$$\begin{array}{r}
 4 \\
 45 \overline{) 270} \\
 \underline{225} \\
 509 \overline{) 4581} \\
 \underline{4581}
 \end{array}$$

32.  $4'20'25$  ( 2.05, Ans.

$$\begin{array}{r}
 4 \\
 405 \overline{) 2025} \\
 \underline{2025}
 \end{array}$$

33.  $18'66'24$  ( 43.2, Ans.

$$\begin{array}{r}
 16 \\
 83 \overline{) 266} \\
 \underline{249} \\
 862 \overline{) 1724} \\
 \underline{1724}
 \end{array}$$

34.  $0'00'94'09$  ( 0.097, Ans.

$$\begin{array}{r}
 00 \\
 94 \\
 81 \\
 187 \overline{) 1309} \\
 \underline{1309}
 \end{array}$$

35.  $0'05'62'50$  ( 0.237+, Ans.

$$\begin{array}{r}
 04 \\
 43 \overline{) 162} \\
 \underline{129} \\
 467 \overline{) 3350} \\
 \underline{3269} \\
 81
 \end{array}$$

36.  $0'94'09$  ( 0.97, Ans.

$$\begin{array}{r}
 81 \\
 187 \overline{) 1309} \\
 \underline{1309}
 \end{array}$$

37.  $7'78'41$  ( 279, Ans.

$$\begin{array}{r}
 4 \\
 47 \overline{) 378} \\
 \underline{329} \\
 549 \overline{) 4941} \\
 \underline{4941}
 \end{array}$$

38.  $16.'24/09$  (4.03, Ans.

$$\begin{array}{r} 16 \\ 803 \overline{) 2409} \\ \underline{2409} \end{array}$$

39.  $14.'89/96$  (3.86, Ans.

$$\begin{array}{r} 9 \\ 68 \overline{) 589} \\ \underline{544} \\ 766 \overline{) 4596} \\ \underline{4596} \end{array}$$

40.  $39.'06/25$  (6.25, Ans.

$$\begin{array}{r} 36 \\ 122 \overline{) 306} \\ \underline{244} \\ 1245 \overline{) 6225} \\ \underline{6225} \end{array}$$

41.  $5/38.'00/00$  (23.19+, Ans.

$$\begin{array}{r} 4 \\ 43 \overline{) 138} \\ \underline{129} \\ 461 \overline{) 900} \\ \underline{461} \\ 4638 \overline{) 43900} \\ \underline{41742} \\ 2158 \end{array}$$

42.

$71.'00/00/00$  (8.426+, Ans.

$$\begin{array}{r} 64 \\ 164 \overline{) 700} \\ \underline{656} \\ 1682 \overline{) 4400} \\ \underline{3364} \\ 16846 \overline{) 103600} \\ \underline{101076} \\ 2524 \end{array}$$

43.

$0.'00/20/00/00$  (0.0447+, Ans.

$$\begin{array}{r} 16 \\ 84 \overline{) 400} \\ \underline{336} \\ 887 \overline{) 6400} \\ \underline{6209} \\ 191 \end{array}$$

**Article 376.**

45.  $\sqrt{\frac{3721}{7569}} = \frac{\sqrt{3721}}{\sqrt{7569}} = \frac{61}{87}$ , Ans.

46.  $\sqrt{\frac{1899}{10339}} = \frac{\sqrt{9}}{\sqrt{49}} = \frac{3}{7}$ , Ans.



$$47. \sqrt{60\frac{1}{16}} = \frac{\sqrt{961}}{\sqrt{16}} = \frac{31}{4} = 7\frac{3}{4}, \text{ Ans.}$$

$$48. \sqrt{37\frac{4}{9}} = \frac{\sqrt{1849}}{\sqrt{49}} = \frac{43}{7} = 6\frac{1}{7}, \text{ Ans.}$$

$$49. \sqrt{49\frac{1}{3}} = \sqrt{49.444444+} = 7.031+, \text{ Ans.}$$

$$50. \sqrt{\frac{450}{2048}} = \frac{\sqrt{225}}{\sqrt{1024}} = \frac{15}{32}, \text{ Ans.}$$

$$51. \sqrt{72\frac{1}{4}} = \frac{\sqrt{289}}{\sqrt{4}} = \frac{17}{2} = 8\frac{1}{2}, \text{ Ans.}$$

$$52. \sqrt{\frac{30}{32}} = \sqrt{0.9375} = 0.968+, \text{ Ans.}$$

$$53. \sqrt{\frac{3}{4} + \frac{5}{6} + \frac{6}{9}} = \sqrt{2.25} = 1.5, \text{ Ans.}$$

$$54. \sqrt{981\frac{1}{9}} = \frac{\sqrt{8836}}{\sqrt{9}} = \frac{94}{3} = 31\frac{1}{3}, \text{ Ans.}$$

$$55. \sqrt{146\frac{1}{3}} = \sqrt{146.625} = 12.108+, \text{ Ans.}$$

$$56. \sqrt{81\frac{9}{25}} = \sqrt{81.36} = 9.019+, \text{ Ans.}$$

$$57. \sqrt{\frac{7}{8}} = \sqrt{0.875} = 0.935+, \text{ Ans.}$$

$$58. \sqrt{\frac{11}{16}} = \sqrt{0.6875} = 0.829+, \text{ Ans.}$$

59.  $22'65'76$  (476 men, Ans.

$$\begin{array}{r}
 16 \\
 87 \overline{) 665} \\
 \underline{609} \\
 946 \overline{) 5676} \\
 \underline{5676}
 \end{array}$$

60.

$$\begin{array}{l}
 3 \text{ A. } 1 \text{ sq. rd.} = 481 \text{ sq. rd.} \\
 5 \text{ " } 69 \text{ " } = 869 \text{ " } \\
 6 \text{ " } 91 \text{ " } = 1051 \text{ " } \\
 481 \text{ sq. rd.} + 869 \text{ sq. rd.} + 1051 \text{ sq. rd.} = \\
 2401 \text{ sq. rd.}
 \end{array}$$

$$\sqrt{2401} = 49 \text{ rd., Ans.}$$

**Article 384.**

64.

 $91'125$  (45, Ans.

$$\begin{array}{r}
 64 \\
 40^2 \times 3 = 4800 \\
 40 \times 5 \times 3 = 600 \\
 5^2 = 25 \\
 \hline
 5425 \quad 27125
 \end{array}$$

65.

 $421'875$  (75, Ans.

$$\begin{array}{r}
 343 \\
 70^2 \times 3 = 14700 \\
 70 \times 5 \times 3 = 1050 \\
 5^2 = 25 \\
 \hline
 15775 \quad 78875
 \end{array}$$

66.

 $571'787$  (83, Ans.

$$\begin{array}{r}
 512 \\
 80^2 \times 3 = 19200 \\
 80 \times 3 \times 3 = 720 \\
 3^2 = 9 \\
 \hline
 19929 \quad 59787
 \end{array}$$

67.

912.'673 ( 9.7, Ans.

729

$90^2 \times 3 =$	24300	183673
$90 \times 7 \times 3 =$	1890	
$7^2 =$	49	
	<u>26239</u>	183673

68.

3'796'416 ( 156, Ans.

1

$10^2 \times 3 =$	300	2796
$10 \times 5 \times 3 =$	150	
$5^2 =$	25	
	<u>475</u>	2375
$150^2 \times 3 =$	67500	421416
$150 \times 6 \times 3 =$	2700	
$6^2 =$	36	
	<u>70236</u>	421416

69.

12'977'875 ( 235, Ans.

8

$20^2 \times 3 =$	1200	4977
$20 \times 3 \times 3 =$	180	
$3^2 =$	9	
	<u>1389</u>	4167
$230^2 \times 3 =$	158700	810875
$230 \times 5 \times 3 =$	3450	
$5^2 =$	25	
	<u>162175</u>	810875

70.

60'236.'288 ( 39.2, Ans.

27

$30^2 \times 3 =$	2700	33236
$30 \times 9 \times 3 =$	810	
$9^2 =$	81	
	<u>3591</u>	32319
$390^2 \times 3 =$	456300	917288
$390 \times 2 \times 3 =$	2340	
$2^2 =$	4	
	<u>458644</u>	917288

71.

101'847'563 ( 467, Ans.

64

$40^2 \times 3 =$	4800	37847
$40 \times 6 \times 3 =$	720	
$6^2 =$	36	
	<u>5556</u>	33336
$460^2 \times 3 =$	634800	4511563
$460 \times 7 \times 3 =$	9660	
$7^2 =$	49	
	<u>644509</u>	4511563

72.

258'474'853 ( 637, Ans.

216

$60^2 \times 3 =$	10800	42474
$60 \times 3 \times 3 =$	540	
$3^2 =$	9	
	<u>11349</u>	34047
$630^2 \times 3 =$	1190700	8427853
$630 \times 7 \times 3 =$	13230	
$7^2 =$	49	
	<u>1203979</u>	8427853

73.

6'372.'783'864 ( 18.54, Ans.

	1	
$10^2 \times 3 =$	300	5372
$10 \times 8 \times 3 =$	240	
$8^2 =$	64	
	<u>604</u>	4832
$180^2 \times 3 =$	97200	540783
$180 \times 5 \times 3 =$	2700	
$5^2 =$	25	
	<u>99925</u>	499625
$1850^2 \times 3 =$	10267500	41158864
$1850 \times 4 \times 3 =$	22200	
$4^2 =$	16	
	<u>10289716</u>	41158864

75.

64'481.'201 ( 40.1, Ans.

	64	
$400^2 \times 3 =$	480000	481201
$400 \times 1 \times 3 =$	1200	
$1^2 =$	1	
	<u>481201</u>	481201

76.

37'259'704 ( 334, Ans.

	27	
$30^2 \times 3 =$	2700	10259
$30 \times 3 \times 3 =$	270	
$3^2 =$	9	
	<u>2979</u>	8937
$330^2 \times 3 =$	326700	1322704
$330 \times 4 \times 3 =$	3960	
$4^2 =$	16	
	<u>330676</u>	1322704

77.

0.'000'001'728 (0.012, Ans.

	1	
$10^3 \times 3 =$	300	728
$10 \times 2 \times 3 =$	60	
$2^3 =$	4	
	<u>364</u>	728

78.

1'860'867 (123, Ans.

	1	
$10^3 \times 3 =$	300	860
$10 \times 2 \times 3 =$	60	
$2^3 =$	4	
	<u>364</u>	728
$120^3 \times 3 =$	43200	132867
$120 \times 3 \times 3 =$	1080	
$3^3 =$	9	
	<u>44289</u>	132867

79.

8.'144'865'728 (2.012, Ans.

	8	
$200^3 \times 3 =$	120000	144865
$200 \times 1 \times 3 =$	600	
$1^3 =$	1	
	<u>120601</u>	120601
$2010^3 \times 3 =$	12120300	24264728
$2010 \times 2 \times 3 =$	12060	
$2^3 =$	4	
	<u>12132364</u>	24264728

80.

0.'075'686'967 ( 0.423, Ans.

	64	
$40^2 \times 3 = 4800$	11686	
$40 \times 2 \times 3 = 240$		
$2^2 = 4$		
<u>5044</u>	10088	
$420^2 \times 3 = 529200$	1598967	
$420 \times 3 \times 3 = 3780$		
$3^2 = 9$		
<u>532989</u>	1598967	

81.

0.'008'649'000 ( 0.205+, Ans.

	8	
$200^2 \times 3 = 120000$	649000	
$200 \times 5 \times 3 = 3000$		
$5^2 = 25$		
<u>123025</u>	615125	
	33875	

82.

0.'000'007'000 ( 0.019+, Ans.

	1	
$10^2 \times 3 = 300$	6000	
$10 \times 9 \times 3 = 270$		
$9^2 = 81$		
<u>651</u>	5859	
	141	

83.

25'000'000 ( 2.92+, Ans.

$$\begin{array}{r|l}
 8 & \\
 20^3 \times 3 = 1200 & 17000 \\
 20 \times 9 \times 3 = 540 & \\
 9^3 = 81 & \\
 \hline
 1821 & 16389 \\
 290^3 \times 3 = 252300 & 611000 \\
 290 \times 2 \times 3 = 1740 & \\
 2^3 = 4 & \\
 \hline
 254044 & 508088 \\
 \hline
 & 102912
 \end{array}$$

**Article 385.**

$$85. \sqrt[3]{\frac{68921}{59319}} = \frac{\sqrt[3]{68921}}{\sqrt[3]{59319}} = \frac{41}{39} = 1\frac{2}{3}, \text{ Ans.}$$

$$86. \sqrt[3]{49\frac{8}{27}} = \frac{\sqrt[3]{1331}}{\sqrt[3]{27}} = \frac{11}{3} = 3\frac{2}{3}, \text{ Ans.}$$

$$87. \sqrt[3]{\frac{3}{5}} = \sqrt[3]{0.6} = 0.84+, \text{ Ans.}$$

$$88. \sqrt[3]{\frac{5}{27}} = \sqrt[3]{0.185185+} = 0.57, \text{ Ans.}$$

$$89. \sqrt[3]{81\frac{4}{11}} = \sqrt[3]{81.454545+} = 4.33+, \text{ Ans.}$$

$$90. \sqrt[3]{166\frac{2}{3}} = \sqrt[3]{166.666666+} = 5.503+, \text{ Ans.}$$

$$91. 2150.42 \times 8 = 17203.36 \text{ cu. in.}$$

$$\sqrt[3]{17203.36} = 25.81+ \text{ in., Ans.}$$



**Article 390.**

3.  $20^2 + 15^2 = 400 + 225 = 625$ ;  $\sqrt{625} = 25$  ft., Ans.
4.  $157^2 - 132^2 = 24649 - 17424 = 7225$   
 $\sqrt{7225} = 85$  ft., Ans.
5.  $48^2 + 36^2 = 2304 + 1296 = 3600$ ;  $\sqrt{3600} = 60$  mi., Ans.
6.  $400^2 - 100^2 = 160000 - 10000 = 150000$   
 $\sqrt{150000} = 387.30$  ft., Ans.
7.  $40^2 + 36^2 = 1600 + 1296 = 2896$   
 $\sqrt{2896} = 53.81+$  rd., Ans.
8.  $32^2 - 25^2 = 1024 - 625 = 399$ ;  $\sqrt{399} = 19.97+$  ft.  
 $32^2 - 20^2 = 1024 - 400 = 624$ ;  $\sqrt{624} = 24.97+$  ft.  
 $19.97+$  ft.  $+ 24.97+$  ft.  $= 44.94+$  ft., Ans.

**Article 394.**

9.  $36$  ft.  $\times 15$  ft.  $= 540$  sq. ft., Ans.
10.  $16$  ft.  $\times 12$  ft.  $= 192$  sq. ft., Ans.
11.  $37$  ft.  $\times 27$  ft.  $= 999$  sq. ft.;  $40$  ft.  $\times 20$  ft.  $= 800$  sq. ft.  
 $999$  sq. ft.  $- 800$  sq. ft.  $= 199$  sq. ft., Ans.

**Article 396.**

12.  $\frac{120 + 100}{2} \times 85 = 9350$  sq. ft., Ans.
13.  $60^{\text{cm}} = 0.6^{\text{m}}$ ;  $40^{\text{cm}} = 0.4^{\text{m}}$ ;  $\frac{0.6^{\text{m}} + 0.4^{\text{m}}}{2} = 0.5^{\text{m}}$   
 $0.5^{\text{m}} \times 6^{\text{m}} = 3^{\text{m}}$ , Ans.

$$14. \frac{131 \text{ yd.} + 243 \text{ yd.}}{2} \times 220 = 41140 \text{ sq. yd.}$$

$$41140 \text{ sq. yd.} = 8\frac{1}{2} \text{ acres, Ans.}$$

**Article 398.**

$$16. \frac{14 \text{ ft.} + 18 \text{ ft.}}{2}, \text{ or } 16 \text{ ft.,} \times 65 \text{ ft.,} = 1040 \text{ sq. ft., Ans.}$$

$$17. \frac{58\frac{1}{2} \text{ ft.} + 65\frac{1}{2} \text{ ft.}}{2}, \text{ or } 62\frac{1}{2} \text{ ft.,} \times 126\frac{1}{2} \text{ ft.} = 7843\frac{3}{4} \text{ sq. ft.}$$

$$7843\frac{3}{4} \text{ sq. ft.} \div 9 = 871\frac{1}{3}\frac{2}{3} \text{ sq. yd., Ans.}$$

**Article 400.**

$$18. 15 \times 6 = 90 \text{ cu. ft., Ans.}$$

$$19. 6^{\text{m}} = 600^{\text{cm}}; 18 \times 20 \times 600 = 216000^{\text{cm cm}}, \text{ Ans.}$$

$$20. 20 \text{ ft. } 6 \text{ in.} = 246 \text{ in.; } 1075.30 \times 246 = 264523.8 \text{ cu. in.} = 153\frac{233}{80} \text{ cu. ft., Ans.}$$

**Article 403.**

$$21. 14 \text{ ft. } 3 \text{ in.} = 14.25 \text{ ft.; } 14.70 \times \frac{14.25}{3} = 69.825 \text{ cu. ft., Ans.}$$

$$22. 12.5^{\text{m}} \div 3.1416 = 3.979^{\text{m}}, \text{ diameter of base.}$$

$$\frac{3.979}{2} \times \frac{12.5}{2} = 12.434375, \text{ area of base.}$$

$$12.434375 \times \frac{15.06}{3} = 62.42 + ^{\text{cm m}}, \text{ Ans.}$$

$$23. 693^2 = 480249 \text{ sq. ft., area of base.}$$

$$480249 \times \frac{500}{3} = 80041500 \text{ cu. ft., Ans.}$$

**Article 405.**

25.  $3 \times 3.1416 = 9.4248$  ft., circumference of larger end.

$$\frac{9.4248}{2} \times \frac{3}{2} = 7.0686 \text{ ft., area of base.}$$

$2.5 \times 3.1416 = 7.854$  ft., circumference of smaller end.

$$\frac{7.854}{2} \times \frac{2.5}{2} = 4.90875, \text{ area of base.}$$

$$7.0686 \times 4.90875 = 34.69799025$$

$$\sqrt{34.69799025} = 5.8905$$

$$7.0686 + 4.90875 + 5.8905 = 17.86785$$

$$17.86785 \times \frac{28.5}{3} = 169.744575 \text{ cu. ft., Ans.}$$

26.  $27 \text{ in.} = \frac{9}{4} \text{ ft.}; \frac{9}{4} \times \frac{9}{4} = \frac{81}{16}; 16 \text{ in.} = \frac{4}{3} \text{ ft.}; \frac{4}{3} \times \frac{4}{3} = \frac{16}{9}$

$$\frac{\overset{9}{81}}{\underset{16}{16}} \times \frac{\overset{9}{16}}{\underset{9}{9}} = 9; \sqrt{9} = 3; \frac{81}{16} + \frac{16}{9} + 3 = \frac{1417}{144}$$

$$18 \text{ ft. } 8 \text{ in.} = \frac{56}{3} \text{ ft.}; \frac{56}{3} \text{ ft.} \div 3 = \frac{56}{9} \text{ ft.}$$

$$\frac{\overset{7}{1417}}{\underset{18}{144}} \times \frac{\overset{7}{56}}{\underset{9}{9}} = \frac{9919}{162} = 61\frac{37}{162} \text{ cu. ft., Ans.}$$

**Article 407.**

27.  $25^2$ , or  $625$ ,  $\times 3.1416 = 1963.5$  sq. in., Ans.

28.  $18^2$ , or  $324$ ,  $\times 3.1416 = 1017.8784$  sq. cm.

$$1017.8784 \text{ sq. cm.} \div 10000 = 0.1017874 \text{ sq. in., Ans.}$$

$$29. 50^3 = 125000; 125000 \times \frac{3.1416}{6} = 65450 \text{ cu. ft., Ans.}$$

$$30. 2100^3 = 9261000000$$

$$9261000000 \times \frac{3.1416}{6} = 4849059600 \text{ cu. mi., Ans.}$$

**Article 409.**

$$32. 12^2 : 8^2 = 72 : x \quad \frac{\overset{32}{\cancel{64}} \times \cancel{72}}{\underset{2}{\cancel{144}}} = 32 \text{ sq. ft., Ans.}$$

$$33. 9 : 6.25 = 120^2 : x^2 \quad \frac{\overset{1600}{\cancel{14400}} \times 6.25}{\underset{9}{\cancel{9}}} = 10000$$

$$\sqrt{10000} = 100 \text{ rd., Ans.}$$

$$34. 100 \text{ rd.} \times 3.1416 = 314.16, \text{ circumference of larger circle.}$$

$$\frac{314.16 \times \overset{25}{\cancel{100}}}{\underset{2 \times 2}{\cancel{2}}} = 7854 \text{ sq. ft., area of larger circle.}$$

$$100^2 : 50^2 = 7854 : x$$

$$\frac{\cancel{2500} \times 7854}{\underset{4}{\cancel{10000}}} = 1963.5 \text{ sq. ft., area of smaller circle.}$$

$$7854 \text{ sq. ft.} - 1963.5 \text{ sq. ft.} = 5890.5 \text{ sq. ft., Ans.}$$

$$35. 35^2 : 1.5^2 = 5 : x \quad \frac{2.25 \times \cancel{5}}{\underset{245}{\cancel{1225}}} = \frac{9}{980} \text{ hours, Ans.}$$

$$36. 16^2 : 24^2 = \$30 : x \quad \frac{\overset{9}{\cancel{576}} \times 30}{\underset{4}{\cancel{256}}} = \$67.50, \text{ Ans.}$$

$$37. 15^2 : 45^2 = 105.55 : x \quad \frac{9}{\cancel{2025}} \times \frac{105.55}{\cancel{225}} = 949.95^{\text{cm}}, \text{ Ans.}$$

**Article 412.**

$$39. 400 : 600 = 4^3 : x^3 \quad \frac{6}{\cancel{600}} \times \frac{16}{\cancel{64}} = 96$$

$$\sqrt[3]{96} = 4.57 + \text{ft.}, \text{ Ans.}$$

$$40. 16 : 8 = 12^3 : x^3 \quad \frac{108}{\cancel{16}} \times \frac{8}{\cancel{1728}} = 864; \sqrt[3]{864} = 9.5 + \text{in.}$$

$$12 \text{ in.} - 9.5 \text{ in.} = 2.5 \text{ in.}, \text{ Ans.}$$

$$41. 6^3 : 12^3 = 16.50 : x \quad \frac{8}{\cancel{1728}} \times \frac{16.50}{\cancel{216}} = 132^{\text{K}}, \text{ Ans.}$$

$$42. 2000^3 : 8000^3 = 1 : x \quad \frac{64}{\cancel{512}} \times \frac{1}{\cancel{8}} = 64, \text{ Ans.}$$

$$43. (5\frac{1}{2})^3 : (8\frac{1}{2})^3 = 140 : x \quad \frac{8}{\cancel{128}} \times \frac{\frac{27}{\cancel{35937}}}{\frac{64}{\cancel{8}}} \times \frac{35}{\cancel{140}} = 472\frac{1}{2} \text{ lb.}, \text{ Ans.}$$

**Article 413.**

$$49. \$1 \times 1.10 = \$1.10.$$

$$\$7700 \div \$1.10 = \$7000, \text{ present worth of } \$7700.$$

$$\$7000 - \$7000 = 0. \quad \text{Hence they do not differ, Ans.}$$

50.  $\$0.32 - \$0.28 = \$0.04$ , loss.

$$\frac{4}{32} = \frac{1}{8}; \frac{1}{8} \text{ of } 100\% = 12\frac{1}{2}\%, \text{ loss, Ans.}$$

51.  $100\% - 10\% = 90\%$ .

$90\% \text{ of } \$40 = \$36$ , what the suit is sold for.

$100\% + 25\% = 125\% ; \$36 = 125\%$ .

$$\frac{\$36}{125} \times 100 = \$28.80, \text{ cost of the suit, Ans.}$$

52.  $\sqrt[3]{\frac{27}{64}} = \frac{3}{4}; \left(\frac{3}{4}\right)^2 = \frac{9}{16}; 33\frac{1}{3}\% = \frac{1}{3}; \frac{1}{3} \text{ of } \frac{9}{16} = \frac{3}{16}, \text{ Ans.}$

53.  $(14 \text{ ft.})^2 = 196 \text{ sq. ft. on 1 face.}$

$196 \text{ sq. ft.} \times 6 = 1176 \text{ sq. ft.} = \text{surface of 6 faces, Ans.}$

54.  $38 - 13 = 25 \text{ States, increase; } \frac{25}{13} \text{ of } 100\% = 192\frac{1}{3}\%, \text{ Ans.}$

55.  $16\frac{2}{3}\% + 20\% = 36\frac{2}{3}\% ; 100\% - 36\frac{2}{3}\% = 63\frac{1}{3}\%.$

$$\$5700 = 63\frac{1}{3}\% ; \frac{\$5700}{63\frac{1}{3}} \times 100 = \$9000, \text{ Ans.}$$

56.  $100\% - 20\% = 80\%.$

$80\% \text{ of } \$0.80 = \$0.64$ , cost of the books.

$15\% \text{ of } \$1 = \$0.15 ; \$1.00 - \$0.15 = \$0.85.$

$5\% \text{ of } \$0.85 = \$0.04\frac{1}{4}.$

$\$0.85 - \$0.04\frac{1}{4} = \$0.80\frac{3}{4}$ , selling price.

$\$0.80\frac{3}{4} - \$0.64 = \$0.16\frac{3}{4}$ , gain, Ans.

57.  $\$8.50 \times 2000 = \$17000$ , received for flour.

$1\frac{1}{2}\% \text{ of } \$17000 = \$255$ , commission.

$\$255 + \$74 + \$27 = \$356.$

$\$17000 - \$356 = \$16644$ , Ans.

58.  $62.40 \div .00\frac{1}{2} = \$24960 = \frac{2}{3}$  of value of house.

$$\frac{\$24960}{3} \times 4 = \$33280, \text{ value of the house.}$$

$$\$24960 - \$33280 = \$8320.$$

$$\$8320 + \$62.40 = \$8382.40, \text{ Ans.}$$

59.  $\$25375 = 101\frac{1}{2}\%$  of the purchase money.

$$\frac{\$25375}{101\frac{1}{2}} \times 100 = \$25000, \text{ with which to buy cotton.}$$

$$\$25000 \div \$0.12\frac{1}{2} = 200000 \text{ lb., Ans.}$$

60. The annual income of a share of 6% stock is \$6.

If the cost is \$112, the income is  $\frac{6}{112}$ , or  $\frac{3}{56}$  of the cost.

$$\frac{3}{56} \text{ of } 100\% = 5\frac{5}{14}\% \text{ of the cost, Ans.}$$

61. From May 30, 1878, to Dec. 24, 1881, = 3 y. 6 mo. 24 d.

$$2) \$892 = \text{Principal.}$$

$$\frac{4.46}{892} = 1 \text{ month's interest.}$$

$$\frac{42\frac{1}{2}}{4.46} = \text{Time in months.}$$

$$\frac{892}{1784}$$

$$1784$$

$$3568$$

$$\$190.888 = \text{Interest at } 6\%.$$

$$47.722 = \text{ " " } 1\frac{1}{2}\%.$$

$$\$143.166 = \text{ " " } 4\frac{1}{2}\%.$$

$$892.$$

$$\text{Ans. } \$1035.166, \text{ Amount.}$$

62. \$ 600 = 120 % of cost of 1st piano.

$$\frac{\$600}{120} \times 100 = \$500, \text{ cost of 1st piano.}$$

$$\$600 = 80 \% \text{ of cost of 2d piano.}$$

$$\frac{\$600}{80} \times 100 = \$750, \text{ cost of 2d piano.}$$

$$\$600 + \$600 = \$1200, \text{ what was received for both.}$$

$$\$500 + \$750 = \$1250, \text{ cost of both.}$$

$$\$1250 - \$1200 = \$50, \text{ loss, Ans.}$$

63. Principal for 1st 6 mo. . . . .	\$ 1200.00
Interest " " . . . . .	24.00
Principal for 2d 6 mo. . . . .	\$ 1224.00
Interest " " . . . . .	24.48
Principal for 3d 6 mo. . . . .	\$ 1248.48
Interest " " . . . . .	24.97
Principal for 3 mo. 18 d. . . . .	\$ 1273.45
Interest " " " . . . . .	15.28
Compound amount for 1 y. 9 mo. 18 d. .	\$ 1288.73
Given principal . . . . .	1200.00
Compound interest . . . . .	Ans. \$ 88.73

64.  $\$1 \times .08 \times \frac{3}{4} = \$0.06$ , int. of \$ 1 for 9 mo. at 8%.

$$\$1 + \$0.06 = \$1.06, \text{ amount of \$ 1 for 9 mo.}$$

$$\$1500 \div \$1.06 = \$1415.094, \text{ present worth.}$$

$$\$1500 - \$1415.094 = \$84.906, \text{ discount, Ans.}$$

65.  $\$1000 \times .07 = \$70$ , int. of \$ 1000 for 1 year.

$$\$1500 - \$1000 = \$500, \text{ interest.}$$

$$\$500 \div \$70 = 7\frac{1}{2}. \quad \text{Ans. } 7\frac{1}{2} \text{ years.}$$



## 66.

Principal . . . . .	\$ 1600.00
Int. from Jan. 1, 1879, to July 10, 1879, 6 m. 9 d.	50.40
Amount . . . . .	<u>\$ 1650.40</u>
1st payment . . . . .	200.00
New principal . . . . .	<u>\$ 1450.40</u>
Int. from July 10, 1879, to Aug. 15, 1880, 1y. 1m. 5d.	95.48
Amount . . . . .	<u>\$ 1545.88</u>
2d payment . . . . .	200.00
New principal . . . . .	<u>\$ 1345.88</u>
Int. from Aug. 15, 1880, to May 12, 1881, 8 m. 27 d.	59.89
Amount . . . . .	<u>\$ 1405.77</u>
3d payment . . . . .	200.00
New principal . . . . .	<u>\$ 1205.77</u>
Int. from May 12, 1881, to Jan. 1, 1882, 7 m. 20 d.	46.22
Amount due Jan. 1, 1882 . . . . . Ans.	<u>\$ 1251.99</u>

67.  $\$1.87 \times 62\frac{3}{4} = \$117.65\frac{1}{8}$ .

15% of  $\$117.65\frac{1}{8} = \$17.64\frac{3}{4}$ , discount.

$\$117.65\frac{1}{8} - \$17.64\frac{3}{4} = \$100.00\frac{7}{8}$ , Ans.

## 68.

$\frac{1}{2}\%$  of  $\$8000 = \$40$ , paid for insurance.

$\$8000 + \$40 + \$64 + \$1260 = \$9364$ , whole cost.

Int. of  $\$11000$  for 2 mo. 3 d. at  $5\% = \$96.25$ , bank discount.

$\$11000 - \$96.25 = \$10903.75$ , proceeds of the note.

$\$10903.75 - \$9364 = \$1539.75$ , gain, Ans.

69. Bank discount of  $\$1$  for 4 mo. 3 d. at  $4\% = \$0.013\frac{3}{4}$ .

Proceeds of  $\$1 = \$1 - \$0.013\frac{3}{4} = \$0.986\frac{1}{4}$ .

$\$800 \div 0.986\frac{1}{4} = \$811.08\frac{1}{4}\frac{3}{8}$ , face of the note, Ans.

70.  $\$143\frac{1}{2} + \$\frac{1}{2} = \$143\frac{3}{4}$ , cost of 1 share.

$\$143\frac{3}{4} \times 125 = \$17968\frac{3}{4}$ , Ans.

71. 93 d. after April 10, 1882 = July 12, day of maturity.  
 From May 14 to July 12 = 59 d., term of discount.  
 Int. of \$ 1292 for 59 d. at 6% = \$ 12.70 $\frac{1}{8}$ , bank discount.  
 \$ 1292 - \$ 12.70 $\frac{1}{8}$  = \$ 1279.29 $\frac{2}{8}$ , proceeds, Ans.

72. \$ 1 of exchange = 5.14 francs.

$$8500 \text{ francs} \div 5.14 \text{ francs} = \$ 1653.69+, \text{ Ans.}$$

73.  $\sqrt{0.0625} : (\frac{1}{2})^2 = x : \sqrt[3]{15.625}$ ; or  $.25 : \frac{1}{4} = x : 2.5$   

$$\frac{.25 \times 4 \times 2.5}{1} = 2.5, \text{ Ans.}$$

74. Since the mean proportional between the extremes of a proportion is one of the equal means of the proportion (Art. 346), the mean proportional between two numbers is equal to the square root of their product. Hence,

$$\sqrt{816 \times 97\frac{1}{2}} = \sqrt{79560} = 282.0638+, \text{ Ans.}$$

75.  $\frac{3}{4}$  lb. = 12 oz.; 12 oz. :  $\frac{3}{5}$  oz. = \$  $\frac{5}{6}$  :  $x$

$$\frac{1 \times 3 \times 5}{12 \times 3 \times 6} = \$ \frac{1}{24}, \text{ or } \$ 0.04\frac{1}{6}, \text{ Ans.}$$

76.  $\left. \begin{array}{l} 8 : 12 \\ 10 : 8.50 \end{array} \right\} = 10 \text{ oz.} : x$

$$\frac{12 \times 8.50 \times 10}{8 \times 10} = 12.75 \text{ oz., Ans.}$$

77.  $\left. \begin{array}{l} 31 : 28 \\ 4 : 3 \\ 3\frac{1}{2} : 4\frac{1}{2} \end{array} \right\} = \$ 4 : x$

$$\frac{28 \times 3 \times 13 \times 4 \times 2}{4 \times 3 \times 31 \times 7} = \frac{104}{31} = \$ 3\frac{1}{31}, \text{ or } \$ 3.35\frac{1}{31}, \text{ Ans.}$$

78.  $14 + 12 + 7 = 33$

$\frac{14}{33}$  of \$7000 = \$2969.69 $\frac{2}{3}$ , 1st child's share.

$\frac{12}{33}$  of \$7000 = \$2545.45 $\frac{1}{3}$ , 2d " "

$\frac{7}{33}$  of \$7000 = \$1484.84 $\frac{2}{3}$ , 3d " "

79. Ames's \$8000 for 12 mo. = \$96000 for 1 mo.

Stevens's \$6000 " 12 " = \$72000 "

Conant's \$5000 " 8 " = \$40000 "

Hubbell's \$3000 " 5 " = \$15000 "

The entire stock = \$223000 "

$\frac{96000}{223000} = \frac{96}{223}$ ;  $\frac{96}{223}$  of \$12000 = \$5165.91 $\frac{2}{3}$ , Ames's share.

$\frac{72000}{223000} = \frac{72}{223}$ ;  $\frac{72}{223}$  of \$12000 = \$3874.43 $\frac{1}{3}$ , Stevens's "

$\frac{40000}{223000} = \frac{40}{223}$ ;  $\frac{40}{223}$  of \$12000 = \$2152.46 $\frac{1}{3}$ , Conant's "

$\frac{15000}{223000} = \frac{15}{223}$ ;  $\frac{15}{223}$  of \$12000 = \$807.17 $\frac{2}{3}$ , Hubbell's "

## 80.

120 rd.  $\times$  80 rd. = 9600 sq. rd., area of 1st lot.

$\sqrt{9600} = 97.979+$  rd. on 1 side of square lot.

97.979 rd.  $\times$  4 = 391.916 rd., perimeter of square lot.

(120 + 80), or 200 rd.,  $\times$  2 = 400 rd., perimeter of rectangular lot.

400 : 391.916 = \$320 :  $x$

$\frac{391.916 \times 320}{400} = \$313.532+$ , Ans.

81.  $90^2 + 90^2 = 8100 + 8100 = 16200$

$\sqrt{16200} = 127.279+$  ft., Ans.

82. A section of land = 1 sq. mi.

1 mi. = 320 rd., length of each side.

$$320^2 + 320^2 = 102400 + 102400 = 204800$$

$$\sqrt{204800} = 452.54+ \text{ rd., Ans.}$$

83.  $\sqrt[3]{25934.336} = 29.6 \text{ ft., Ans.}$

84. 1 quarter-section of land is  $\frac{1}{4}$  mile, or 160 rods, square. She would walk the number of rods on three sides of the square, plus the diagonal of the square.

$$160 \text{ rd.} \times 3 = 480 \text{ rd.}$$

$$160^2 + 160^2 = 25600 + 25600 = 51200$$

$$\sqrt{51200} = 226.274 \text{ rd., diagonal.}$$

$$480 \text{ rd.} + 226.274 \text{ rd.} = 706.274 \text{ rd.}$$

$$706.274 \text{ rd.} = 2 \text{ mi. } 66.274 \text{ rd., Ans.}$$

85.  $32 \times 128 \text{ cu. ft.} = 4096 \text{ cu. ft.}; \sqrt[3]{4096} = 16 \text{ ft., Ans.}$

$$86. 60^2 + 40^2 = 3600 + 1600 = 5200$$

$$\sqrt{5200} = 72.11+ \text{ in., diagonal of 1 side.}$$

$$(72.11+)^2 + 20^2 = 5200 + 400 = 5600$$

$$\sqrt{5600} = 74.833+ \text{ in., Ans.}$$

87. 1 acre = 43560 sq. ft.;  $\sqrt{43560} = 208.71+ \text{ ft., Ans.}$

$$88. 10 \times 160 \text{ sq. rd.} = 1600 \text{ sq. rd.}$$

$$\sqrt{1600} = 40 \text{ rd., length of each side.}$$

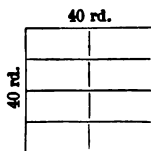
Eight sections of fence, each 40 rd. long, will be required.

$$40 \text{ rd.} \times 8 = 320 \text{ rd.}$$

$$\$0.75 \times 320 = \$240, \text{ Ans.}$$

If the field is divided into 8 lots, each 5 rods wide and 40 rods long, 11 sections of fence, each 40 rods long, will be required.

$$11 \times 40 \times \$0.75 = \$330, \text{ Ans.}$$



$$89. 40^2 - 12^2 = 1600 - 144 = 1456$$

$$\sqrt{1456} = 38.157+ \text{ ft., Ans.}$$

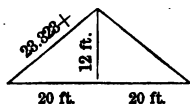
$$90. \sqrt{175616} = 56 \text{ in., length of 1 face.}$$

$$56^2 + 56^2 = 3136 + 3136 = 6272$$

$$\sqrt{6272} = 79.195+ \text{ in., Ans.}$$

$$91. \sqrt{5184} = 72, \text{ the number. } 72^2 = 373248, \text{ Ans.}$$

92.



$$20^2 + 12^2 = 400 + 144 = 544$$

$$\sqrt{544} = 23.323+ \text{ ft., Ans.}$$

$$93. \sqrt{2\frac{5}{9}} = \frac{\sqrt{25}}{\sqrt{9}} = \frac{5}{3}; \quad \sqrt[3]{4\frac{1}{27}} = \frac{\sqrt[3]{125}}{\sqrt[3]{27}} = \frac{5}{3}$$

$$\frac{5}{3} \div \frac{5}{3} = 1, \text{ Ans.}$$

$$94. \sqrt[3]{592704} = 84 \text{ in., length of 1 face.}$$

$$84^2 = 7056 \text{ sq. in., area of 1 face.}$$

$$7056 \text{ sq. in.} \times 6 = 42336 \text{ sq. in., area of 6 faces, Ans.}$$

$$95. 300 \times 2 = 600 \text{ pairs; } \frac{1}{2} \text{ of 6 days} = 3 \text{ days.}$$

$$\left. \begin{array}{l} 300 : 600 \\ 3 : 6 \end{array} \right\} = 8 : x \quad \frac{\overset{2}{600} \times \overset{2}{6} \times 8}{\cancel{800} \times \cancel{8}} = 32 \text{ men.}$$

$$32 \text{ men} - 8 \text{ men} = 24 \text{ men, Ans.}$$

$$96. 6 : 11 = x : 167\frac{1}{2} \quad \frac{6 \times \overset{76}{836}}{\cancel{11} \times 5} = \frac{456}{5} = 91\frac{1}{5}, \text{ Ans.}$$

$$97. \frac{3}{12} : \frac{5}{8} = \frac{6}{24} : \frac{15}{24} = 6 : 15, \text{ or } 2 : 5, \text{ Ans.}$$

$$98. 4\frac{1}{8} : 11\frac{3}{4} = \$1.38 : x \quad \frac{16 \times 91 \times 1.38}{69 \times 8} = \$3.64, \text{ Ans.}$$

$$99. 8 : 24 = 24 : x \quad \frac{24 \times 24}{8} = 72 \text{ men, Ans.}$$

$$100. \text{A's } \$2000 \text{ for 12 mo.} = \$24000 \text{ for 1 mo.}$$

$$\$24000 \text{ for 1 mo.} = \frac{\$24000}{9}, \text{ or } \$2666\frac{2}{3} \text{ for 9 mo., what}$$

B put in.

Ans. \$2666.66\frac{2}{3}.

$$101. 20 \text{ mi.} \times 5 = 100 \text{ mi., A is in advance of B.}$$

$$25 \text{ mi.} - 20 \text{ mi.} = 5 \text{ mi., B gains in 1 day.}$$

$$\left. \begin{array}{l} 100 \div 5 = 20 \text{ days,} \\ 25 \text{ mi.} \times 20 = 500 \text{ mi.,} \end{array} \right\} \text{ Ans.}$$

$$102. \text{The 1st will empty } \frac{1}{2}, \text{ the 2d } \frac{1}{3}, \text{ the 3d } \frac{1}{4}, \text{ in 1 hour.}$$

$$\text{Together they will empty } \frac{1}{2} + \frac{1}{3} + \frac{1}{4} = \frac{13}{12} \text{ in 1 hour.}$$

$$\frac{13}{12} : \frac{12}{12} = 1 \text{ h.} : x$$

$$\frac{12 \times 12 \times 1}{13 \times 12} = \frac{12}{13} \text{ h., or 55 min. } 23\frac{1}{3} \text{ sec., Ans.}$$

$$103. 48 : 36 = 144 : x \quad \frac{36 \times 144}{48} = 108 \text{ men.}$$

$$144 \text{ men} - 108 \text{ men} = 36 \text{ men, Ans.}$$

$$104. \left. \begin{array}{l} 20 : 15 \\ 10 : 15 \end{array} \right\} :: 60 \text{ d.} : x$$

$$\frac{15 \times 15 \times 60}{20 \times 10} = \frac{135}{2} = 67\frac{1}{2} \text{ days, Ans.}$$

105.  $\$3 + \$5 + \$8 = \$16.$

A's stock  $= \frac{3}{16}$ ;  $\frac{3}{16}$  of  $\$2000 = \$375$ , A receives.

B's "  $= \frac{5}{16}$ ;  $\frac{5}{16}$  of  $\$2000 = \$625$ , B receives.

C's "  $= \frac{8}{16}$ ;  $\frac{8}{16}$  of  $\$2000 = \$1000$ , C receives.

106.  $24^2 + 24^2 = 576 + 576 = 1152$

$\sqrt{1152} = 33.941+$  ft.  $= 407.29+$  in., Ans.

107.  $\sqrt[3]{\frac{9}{8}} = \sqrt[3]{1.125} = 1.04+$ , Ans.

$$\begin{array}{r|l} 1.125000 (1.04+ & \\ 1 & \\ \hline 100^2 \times 3 = 30000 & 125000 \\ 100 \times 4 \times 3 = 1200 & \\ 4^2 = 16 & \\ \hline 31216 & 124864 \end{array}$$

108. 8 ft. 6 in.  $= 8.5$  ft.  $8.5^2 : x^2 = 1 : 25$

$\frac{72.25 \times 25}{1} = 1806.25$ ;  $\sqrt{1806.25} = 42.5$  ft., Ans.

109.  $\left(\frac{7}{8}\right)^2 : \left(\frac{3}{4}\right)^2 = 30 \text{ gal.} : x$ ; or,  $\frac{49}{64} : \frac{9}{16} = 30 : x$

$\frac{\cancel{64}^4 \times 9 \times 30}{49 \times \cancel{16}_9} = \frac{1080}{49} = 22\frac{2}{49}$  gal., Ans.

110.  $150 \times 6 \text{ mo.} = 900 \text{ mo.}$

$180 \times 8 \text{ " } = 1440 \text{ "}$

$270 \times 4 \text{ " } = 1080 \text{ "}$

$\frac{600}{3420} \text{ "}$

$5\frac{7}{10} \text{ mo., or } 5 \text{ mo. } 21 \text{ d., Ans.}$

111.  $2456 + 735 + 436 = 3627$

$\frac{2456}{3627}$  of 182 men =  $123\frac{11}{17}$ , or 123 men, 1st.

$\frac{735}{3627}$  of 182 men =  $36\frac{11}{17}$ , or 37 men, 2d.

$\frac{436}{3627}$  of 182 men =  $21\frac{11}{17}$ , or 22 men, 3d.

112.  $54 \text{ ft.} \div 4 = 13.5 \text{ ft.}$ , length of 1 side of base.

$\frac{13.5}{2} \text{ ft.} \times 100 = 675 \text{ sq. ft.}$ , area of 1 side.

$675 \text{ sq. ft.} \times 4 = 2700 \text{ sq. ft.}$ , area of 4 sides.

$2700 \text{ sq. ft.} = 300 \text{ sq. yd.}$ , Ans.

113.

$4^3 : 12^3 = 1 : x$ ; or  $64 : 1728 = 1 : x$   $\frac{1728 \times 1}{64} = 27$ , Ans.

#### Article 414.

1. Four thousand two hundred thirty-eight minus seven hundred fifty-eight equals one hundred forty-five times twenty-four.

2.  $24 \times 325 = 7800$ ;  $36 \times 245 = 8820$ .

$8820 - 7800 = 1020$ , Ans.

3.  $192 \div 16 = 12$ ;  $64 \div 16 = 4$ ;  $12 - 4 = 8$ , Ans.

4.  $125 \times 9 = 1125$ , Ans.

5.  $20 - 12 = 8$  marbles;  $8 \div 2 = 4$  marbles, Ans.

6.  $\$50000 \div 12 = \$4166\frac{2}{3}$ , Ans.

7.  $730 - 365 = 365$ , Ans.



$$8. 16 \div 2 = 8 \text{ years ; } \frac{8}{2} = 4 \text{ years, Ans.}$$

$$9. \frac{(12 \times 9) + 12}{5} = \frac{108 + 12}{5} = 24, \text{ Ans.}$$

$$10. 31 \times 24 \text{ h.} = 744 \text{ hours, Ans.}$$

### Article 415.

$$1. 42 \times 75 = 3150 ; 56700 \div 3150 = 18, \text{ Ans.}$$

$$2. 50000 - 360 = 49640$$

$$49640 \div 136 = 365, \text{ divisor, Ans.}$$

$$3. 149184 \div 84 = 1776, \text{ Ans.}$$

$$4. 32 \text{ mi.} + 36 \text{ mi.} = 68 \text{ mi.}$$

$$1224 \text{ mi.} \div 68 \text{ mi.} = 18 \text{ days, Ans.}$$

$$5. 26402 - 18725 = 7677, \text{ Ans.}$$

6. (1.) As many times as there are units in the multiplier.  
 (2.) When the *multiplicand* is a concrete number.

7. (1.)  $40800 \times 30600 = 1248480000$ , Ans.  
 (2.) Because the multiplicand is an abstract number.

8.  $\$75 \times 8 = \$600$ , cost of 8 horses.  
 $\$125 \times 6 = \$750$ , " 6 horses.  
 $\$600 + \$750 = \$1350$ , whole cost.  
 $8 + 6 = 14$ , number of horses.  
 $\$120 \times 14 = \$1680$ , what they were sold for.  
 $\$1680 - \$1350 = \$330$ , gain, Ans.

$  \begin{array}{r}  3102\overset{44}{\underset{123}{\text{Ans.}}} \\  9. \ 123 \overline{) 381600} \\  \underline{369} \phantom{00} \\  126 \phantom{00} \\  \underline{123} \phantom{00} \\  300 \phantom{00} \\  \underline{246} \phantom{00} \\  54  \end{array}  $	$  \begin{array}{r}  \textit{Proof.} \\  3102, \text{ quotient.} \\  \underline{123, \text{ divisor.}} \\  9306 \\  6204 \\  3102 \\  \underline{381546} \\  54, \text{ remainder.} \\  381600, \text{ dividend.}  \end{array}  $
---	---

10.  $\$ 26 \times 240 = \$ 6240$ , cost.  
 $\$ 6240 - \$ 2820 = \$ 3420$ .  
 $3420 \div 180 = 19$  horses, Ans.

### Article 416.

1. A figure is a character used to represent a number.  
A number is a unit or a collection of units.
2. (1.) Forty thousand ninety and forty-nine thousandths.  
(2.) An Integer.
3. By adding together the difference and subtrahend; the sum should equal the minuend.

$  \begin{array}{r}  832, \text{ minuend.} \\  679, \text{ subtrahend.} \\  \underline{153, \text{ remainder.}}  \end{array}  $	$  \begin{array}{r}  679, \text{ subtrahend.} \\  153, \text{ remainder.} \\  \underline{832, \text{ minuend.}}  \end{array}  $
---	---

4.

$$\begin{array}{r}
 3008.7 \\
 299.99 \\
 8467 \\
 44 \\
 387.5 \\
 6 \\
 86784 \\
 87 \\
 \underline{99084.19, \text{ Ans.}}
 \end{array}$$

5.  $3008.7 - 299.99 = 2708.71$ , Ans.

6.  $8467 + 44 = 8511$ , Ans.

7.	$\begin{array}{r} 387.5 \\ 6 \\ \hline 2325.0, \text{ Ans.} \end{array}$	$\begin{array}{r} 387.5 \\ 387.5 \\ 387.5 \\ 387.5 \\ 387.5 \\ 387.5 \\ \hline 2325.0, \text{ Ans.} \end{array}$
----	--	--

8.	$\begin{array}{r} 997\frac{4}{5}, \text{ Ans.} \\ 87 \overline{) 86784} \\ \underline{783} \\ 848 \\ \underline{783} \\ 654 \\ \underline{609} \\ 45 \end{array}$	<i>Proof.</i> $\begin{array}{r} 997, \text{ quotient.} \\ 87, \text{ divisor.} \\ \hline 6979 \\ 7976 \\ \hline 86739 \\ 45 \\ \hline 86784, \text{ dividend.} \end{array}$
----	---	--

9.  $\$85 + \$165 = \$250$ , cost of cow and horse.

$\$276 - \$250 = \$26$ , Ans.

10.  $\$205 \times 108 = \$22140$ .

$22140 \div 75 = 295$  horses, and  $\$15$  remaining, Ans.

### Article 417.

1.	$\begin{array}{r} 87040 \\ 6080 \\ \hline 6963200 \\ 522240 \\ \hline 529203200, \text{ Ans.} \end{array}$
----	--

2.  $75 \times 128 \text{ cu. ft.} = 9600 \text{ cu. ft.}$ , Ans.

3.  $\$3 \times 45 = \$135$ , value of the apples.  
 $\$2 \times 65 = \$130$ , " " potatoes.  
 $\$135 + \$130 = \$265$ , amount of sale.  
 $\$6 \times 40 = \$240$ , value of the flour.

$$\$265 - \$240 = \$25, \text{ Ans.}$$

4.  $\$38.25 \div 17 = \$2.25$ , Ans.

5.  $84.61$ , multiplicand.  
 $27$ , multiplier.  
 $\begin{array}{r} 59227 \\ 16922 \\ \hline 2284.47 \end{array}$ , product, Ans.

6.  $\$0.16 \times 18 = \$2.88$ , value of the eggs.

$$\$2.88 \div \$0.12 = 24 \text{ lb., Ans.}$$

7.  $814 \times 16 = 13024$ ;  $13024 + 279 = 13303$ .

$$13303 - 384 = 12919 \div 18 = 717\frac{1}{3}, \text{ Ans.}$$

8.  $\begin{array}{r} 827 \\ 215 \\ \hline 4135 \\ 827 \\ 1654 \\ \hline 177805 \end{array}$   $\begin{array}{r} 215 \\ 827 \\ \hline 1505 \\ 430 \\ 1720 \\ \hline 177805 \end{array}$

9.  $\$6.50 \times 8 = \$52$ , cost of the wood.  
 $\$21 \times 18 = \$378$ , " " hay.  
 $\$0.90 \times 7 = \$6.30$ , " " potatoes.  
 $\$52 + \$378 + \$6.30 = \$436.30$ , whole cost.

$$\$436.30 - \$75 = \$361.30, \text{ Ans.}$$

10.  $\$1.50 \times 4 = \$6.00$ , cost of 4 books.

$\$1.80 \times 3 = \$5.40$ , " 3 "

$10 - (4 + 3) = 3$  books.

$\$0.28 \times 3 = \$0.84$ , cost of 3 books.

$\$6 + \$5.40 + \$0.84 = \$12.24$ , whole cost, Ans.

### Article 418.

1.  $\frac{(125 + 36) \times (125 - 36)}{48} = \frac{161 \times 89}{48} = 298\frac{1}{3}$ , Ans.

2.  $\$32400 + \$8400 = \$40800$ , what it was sold for.

$\$40800 \div 360 = \$113\frac{1}{3}$ , Ans.

3.  $\frac{1}{8}$  of 69543248 = 8692906.

$\frac{4}{9}$  of 81369 = 36164.

$8692906 - 36164 = 8656742$ , Ans.

4.  $\frac{1}{5}$  of 1265 books = 253 books.

$\$0.50 \times 253 = \$126.50$ .

$1265 \text{ books} - 253 \text{ books} = 1012 \text{ books}$ .

$\$0.75 \times 1012 = \$759$ .

$\$126.50 + \$759 = \$885.50$ , Ans.

5.  $\$0.24 \times 18 = \$4.32$ , cost of steak.

$\$0.36 \times 4\frac{1}{2} = \$1.62$ , " eggs.

$\$0.18 \times 3 = \$0.54$ , " molasses.

$\$0.75$ , " potatoes.

$\$7.23$ , Ans.

$$\begin{aligned}
 6. \quad & 40 \times 6 = 240 \\
 & 35 \times 5 = 175 \\
 & 18 \times 4 = 72
 \end{aligned}$$

$$240 + 175 + 72 + 115 = 602 \text{ people.}$$

$$602 - 62 = 540; \$0.25 \times 540 = \$135, \text{ Ans.}$$

$$\begin{aligned}
 7. \quad & \$1134.50 - \$55 = \$1079.50, \text{ cost of 254 sheep.} \\
 & \$1079.50 \div 254 = \$4.25, \text{ cost of 1 sheep.}
 \end{aligned}$$

$$\$4.25 \times 54 = \$229.50, \text{ cost of 54 sheep, Ans.}$$

$$8. \quad \$1.00 = 20 \text{ 5-cent pieces.}$$

$$\$720 = 720 \times 20 = 14400, \text{ Ans.}$$

$$9. \quad \$45 \times 75 = \$3375, \text{ value of sewing-machines.}$$

$$\$3375 + \$200 = \$3575, \text{ what was received.}$$

$$\$4278 - \$3575 = \$703, \text{ lost, Ans.}$$

$$\begin{array}{r}
 3010 \\
 10. \quad \frac{6010 \times \cancel{6020} \times \cancel{9}}{\begin{array}{r} 18 \\ 2 \end{array}} = 18090100, \text{ Ans.}
 \end{array}$$

### Article 419.

$$1. \quad 1 + 2 + 3 + 5 + 7 + 11 + 13 + 17 + 19 + 23 + 29 + 31 + 37 = 198.$$

$$\begin{aligned}
 & 4 + 6 + 8 + 9 + 10 + 12 + 14 + 15 + 16 + 18 + 20 + \\
 & 21 + 22 + 24 + 25 + 26 + 27 + 28 + 30 + 32 + 33 + 34 \\
 & + 35 + 36 + 38 + 39 + 40 = 622.
 \end{aligned}$$

$$622 - 198 = 424, \text{ Ans.}$$

$$2. \quad 9, 14, 25, \text{ Ans.}$$

3.

$$\frac{6}{25} + \frac{5}{8} + \frac{3}{4} + \frac{2}{5} + \frac{7}{12} = \frac{144}{600} + \frac{375}{600} + \frac{450}{600} + \frac{240}{600} + \frac{350}{600} = \frac{1559}{600} = 2\frac{359}{600}, \text{ Ans.}$$

$$\begin{array}{l} 4. \quad 16) 96 = 6; \quad 18) 126 = 7; \quad 14) 182 = 13; \\ 16) 112 = 7; \quad 18) 198 = 11; \quad 14) 196 = 14; \\ 97) 873 = 9; \quad \text{Ans. } \frac{6}{7}, \frac{7}{11}, \frac{13}{14}, \frac{9}{11}. \\ 97) 1067 = 11. \end{array}$$

5. (1.) A fractional unit is one of the equal parts into which a unit of a fraction is divided. (Art. 99.) Thus, one third is the fractional unit of thirds.

(2.) The unit of a fraction is the unit divided. Thus halves, thirds, are understood to be halves and thirds of 1.

$$6. \quad 4\frac{7}{33} + 6\frac{2}{138} + 12\frac{25}{138} = 4\frac{2}{13} + 6\frac{2}{3} + 12\frac{1}{6} = \frac{55}{13} + \frac{20}{3} + \frac{73}{6} = \frac{330}{78} + \frac{520}{78} + \frac{949}{78} = \frac{1799}{78}, \text{ or } 23\frac{7}{78}, \text{ Ans.}$$

$$7. \quad \begin{array}{l} (1.) \quad 175\frac{2}{3} = 175\frac{2}{3} = 174\frac{11}{3} \\ 95\frac{5}{8} = \quad \quad \quad \frac{9519}{8} \\ \hline 79\frac{11}{8}, \text{ Ans.} \end{array}$$

$$\begin{array}{l} (2.) \quad 45\frac{5}{8} = 45\frac{5}{8} = 44\frac{13}{8} \\ 25\frac{7}{8} = \quad \quad \quad \frac{257}{8} \\ \hline 19\frac{20}{8}, \text{ Ans.} \end{array}$$

8. (1.) A fraction is multiplied by an integer either by multiplying its numerator or dividing its denominator by the integer.

(2.) Dividing the denominator when it can be done without a remainder.

(3.) Because it shortens the process.

9. (1.)  $175 \times 12 = 2100$

$$\frac{5}{7} \times 12 = \frac{84}{2108\frac{4}{7}}, \text{ Ans.}$$

(2.)  $124 \times 6 = 744$

$$124 \times \frac{3}{4} = \frac{93}{837}, \text{ Ans.}$$

$$(3.) 6\frac{3}{4} \times 12\frac{3}{4} = \frac{5}{8} \times \frac{17}{4} = 85, \text{ Ans.}$$

10.  $\frac{2}{5}$  of  $\frac{3}{4} = \frac{3}{10}$ , part of the ship sold, Ans.

$$\frac{3}{10} \text{ is valued at } \$30000.$$

$$\frac{10000}{\cancel{\$30000} \times 10} = \$100000, \text{ value of ship, Ans.}$$

### Article 420.

1. (1.) A prime number is a number having no other factors than itself and one.

(2.) A composite number is a number having other factors than itself and one.

(3.) A fraction is one or more of the equal parts of a unit.

2.  $182 = 2 \times 7 \times 13$

$$196 = 2 \times 2 \times 7 \times 7$$

$$2 \times 7 = 14, \text{ greatest common divisor, Ans.}$$



$$\begin{aligned}
 3. \quad & 8 = 2 \times 2 \times 2 \\
 & 7 = 1 \times 7 \\
 & 10 = 2 \times 5 \\
 & 14 = 2 \times 7
 \end{aligned}$$

Ans.  $2^3 \times 5 \times 7 = 280$ , least common multiple.

4.

$$13\frac{1}{4} = \frac{53}{4}$$

$$61\frac{1}{8} = \frac{553}{9}$$

$$15\frac{1}{3} = \frac{206}{13}$$

5.

$$75 \overline{) 225} = \frac{3}{5}; \quad 36 \overline{) 180} = \frac{5}{13}. \quad \text{Ans. } \frac{3}{5}, \frac{5}{13}.$$

$$\begin{aligned}
 6. \quad & \frac{1295}{35} = 37 \\
 & \frac{2170}{17} = 127\frac{1}{17} \\
 & \frac{1000}{73} = 13\frac{1}{73}
 \end{aligned}$$

$$\begin{aligned}
 & \frac{8}{9} \times \frac{4}{4} = \frac{32}{36} \\
 & \frac{6}{8} \times \frac{3 \times 9}{4 \times 9} = \frac{27}{36} \\
 & \frac{5}{12} \times \frac{3}{3} = \frac{15}{36} \\
 & \frac{2}{3} \times \frac{12}{12} = \frac{24}{36}
 \end{aligned}$$

$$\text{Ans. } \frac{32}{36}, \frac{27}{36}, \frac{15}{36}, \frac{24}{36}.$$

8. When required to add or subtract them.

$$9. \quad \frac{48\frac{3}{10}}{56\frac{1}{2}} \quad \frac{12}{32} = \frac{3}{8}$$

$$40\frac{1}{3}$$

$$45\frac{1}{6}$$

$$189$$

$$2\frac{1}{10}$$

$$191\frac{1}{10}, \text{ Ans.}$$

$$\frac{3}{10} + \frac{3}{4} + \frac{3}{8} + \frac{27}{40} = \frac{12}{40} + \frac{30}{40} + \frac{15}{40} + \frac{27}{40} =$$

$$\frac{84}{40} = 2\frac{1}{10}$$

10.

$$5\frac{3}{4} + 6\frac{1}{2} = 12\frac{1}{4}; \quad 25\frac{3}{8} \text{ bu.} - 12\frac{1}{4} \text{ bu.} = 13\frac{1}{8} \text{ bu., Ans.}$$

**Article 421.**

$$\begin{aligned} 1 \quad 36 &= 2 \times 2 \times 3 \times 3 \\ 108 &= 2 \times 2 \times 3 \times 3 \times 3 \\ 420 &= 2 \times 2 \times 3 \times 5 \times 7 \end{aligned}$$

$$2^3 \times 3 = 12, \text{ greatest common divisor, Ans.}$$

$$\begin{aligned} 2 \quad 24 &= 2 \times 2 \times 2 \times 3 \\ 180 &= 2 \times 2 \times 3 \times 3 \times 5 \\ 45 &= 3 \times 3 \times 5 \\ 60 &= 2 \times 2 \times 3 \times 5 \end{aligned}$$

$$2^3 \times 3^2 \times 5 = 360, \text{ least common multiple, Ans.}$$

$$\begin{aligned} 3. \quad 12\frac{3}{4} \quad & \frac{3}{4} + \frac{2}{3} + \frac{4}{5} + \frac{7}{8} = \\ 16\frac{3}{4} \quad & \\ 24\frac{4}{8} \quad & \\ \frac{40\frac{7}{8}}{92} \cdot \quad & \frac{90}{120} + \frac{80}{120} + \frac{96}{120} + \frac{105}{120} = \frac{371}{120} = 3\frac{11}{120} \\ & \frac{3\frac{11}{120}}{95\frac{11}{120}}, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 4. \quad 84\frac{1}{3} &= 84\frac{2}{3} = 83\frac{2}{3} \\ 42\frac{1}{2} &= 42\frac{1}{2} \\ &= 41\frac{1}{2}, \text{ Ans.} \end{aligned}$$

$$\begin{aligned} 5. \quad \frac{2}{3} \text{ of } 12\frac{3}{4} \times 36\frac{3}{8} &= \frac{2}{3} \text{ of } \frac{101}{8} \times \frac{182}{5} = \frac{9191}{30} = 306\frac{11}{30}, \text{ Ans.} \\ & \frac{4}{2} \end{aligned}$$

$$6. 27\frac{3}{4} = \frac{111}{4}; \quad \frac{2}{3} \text{ of } 8\frac{1}{2} = \frac{2}{3} \text{ of } \frac{17}{2} = \frac{17}{3}.$$

$$\frac{111}{4} \div \frac{17}{3} = \frac{111}{4} \times \frac{3}{17} = \frac{333}{68} = 4\frac{51}{68}, \text{ Ans.}$$

$$7. \frac{\frac{7}{12}}{\frac{5}{8}} = \frac{7}{12} \times \frac{8}{5} = \frac{14}{15}, \text{ Ans.} \quad \frac{6\frac{2}{3}}{9\frac{3}{4}} = \frac{27}{4} \times \frac{3}{29} = \frac{81}{116}, \text{ Ans.}$$

$$8. \frac{\$7000}{2} \times 3 = \$10500, \text{ value of the farm.}$$

$$\frac{5}{8} \text{ of } \$10500 = \$5187\frac{5}{8}, \text{ Ans.}$$

$$9. 240 \div 5\frac{1}{2} = 240 \times \frac{2}{11} = \frac{480}{11} \text{ mi., what he travels in 1 d.}$$

$$\frac{960}{23} \times 3\frac{1}{2} = \frac{960}{23} \times \frac{7}{2} = \frac{3360}{23} = 146\frac{12}{23} \text{ mi., Ans.}$$

$$10. \frac{\$120}{\frac{40}{3}} \times 7 = \$280, \text{ value of the coal.}$$

$$\$280 \div \$6 = 46\frac{2}{3} \text{ tons, Ans.}$$

### Article 422

1. (1.) Factoring is the process of finding the factors of composite numbers.

(2.) The terms of a fraction are its *denominator*, which shows into how many equal parts the unit is divided; and its *numerator*, which shows how many of the equal parts of the unit are taken.

2. Two or more numbers are said to be prime to each other when they have no common factor.

$$3. \frac{\overset{5}{\cancel{800}} \times \overset{6}{\cancel{273}} \times \overset{11}{\cancel{44}} \times 15}{\cancel{160} \times \cancel{63} \times \cancel{11} \times \cancel{4}} = 450, \text{ Ans.}$$

$$4. 135 \div 9 = 15; \quad \frac{4 \times 15}{9 \times 15} = \frac{60}{135}, \text{ Ans.}$$

$$5. \begin{array}{r} 36\frac{2}{3} = 36\frac{2}{3} = 35\frac{2}{3} \\ 15\frac{2}{3} = \frac{15\frac{2}{3}}{20\frac{1}{3}}, \text{ Ans.} \end{array}$$

$$6. \frac{3}{4} \text{ of } 17 = \frac{51}{4}; \quad 12\frac{3}{4} \div \frac{51}{4} = \frac{112}{9} \times \frac{4}{51} = \frac{448}{459}, \text{ Ans.}$$

7.

$$\frac{2}{3} \text{ of } \frac{5}{7} = \frac{10}{21}; \quad \frac{10}{21} = \$45000; \quad \frac{\$45000}{10} \times 21 = \$94500, \text{ Ans.}$$

$$8. \frac{\overset{800}{\cancel{4000}}}{5} \times 8 = \$6400, \text{ value of the farm.}$$

$$\frac{3}{4} \text{ of } \$6400 = \$4800, \text{ Ans.}$$

$$9. \frac{\frac{7}{8} \times \frac{2}{3}}{4\frac{1}{2} \div \frac{1}{3}} = \frac{\frac{14}{24}}{\frac{27}{2}} = \frac{\cancel{14}}{\cancel{24}} \times \frac{\cancel{2}}{27} = \frac{7}{162}, \text{ Ans.}$$

6

$$10. 1 = \frac{247832}{247832}; \quad \frac{247832}{247832} \div \frac{3}{247832} = 82610\frac{2}{3}; \quad \frac{3}{247832} \text{ is}$$

a small fraction, since it takes  $82610\frac{2}{3}$  times this fraction to equal one.

**Article 423.**

$$1. \begin{array}{l} 1001 \overline{) 3003} = \frac{3}{5}; \quad 29 \overline{) 87} = \frac{3}{5}; \quad 143 \overline{) 429} = \frac{3}{5} \\ 1001 \overline{) 5005} = \frac{5}{5}; \quad 29 \overline{) 145} = \frac{5}{5}; \quad 143 \overline{) 715} = \frac{5}{5}. \end{array}$$

$$2. 4\frac{1}{21} + 3\frac{1}{4} + 4\frac{8}{9} + \frac{4}{7} = 11 + \frac{4}{84} + \frac{147}{84} + \frac{224}{84} + \frac{72}{84} = \\ 11\frac{4+147+224+72}{84} = 11 + 5\frac{2}{3} = 16\frac{2}{3}, \text{ Ans.}$$

$$3. \begin{array}{r} 31\frac{1}{2} = 31\frac{3}{6} = 30\frac{3}{3} \\ 12\frac{4}{6} = \quad \quad 12\frac{3}{3} \\ \hline 18\frac{3}{3}, \text{ Ans.} \end{array} \quad 4. \begin{array}{r} \$4283\frac{1}{3} = \$4282\frac{2}{3} \\ \$1597\frac{3}{4} = \$1597\frac{3}{4} \\ \hline \$2685\frac{5}{4}, \text{ Ans.} \end{array}$$

$$5. 641 \times 5 = 3205 \\ 641 \times \frac{3}{2} = \frac{2403}{2}, \text{ Ans.}$$

$$6. \frac{1}{17} \text{ of } 3\frac{1}{4} \text{ of } 4\frac{1}{2} \text{ of } 63\frac{3}{4} \text{ of } 2\frac{1}{8} = \frac{1}{17} \text{ of } \frac{22}{7} \text{ of } \frac{17}{4} \text{ of } \frac{191}{8} \text{ of } \frac{21}{28} \\ = \frac{2101}{56}, \text{ Ans.}$$

$$7. \frac{8\frac{2}{3}}{9\frac{3}{4}} = \frac{42}{5} \times \frac{4}{39} = \frac{56}{65}; \quad \frac{56}{65} + 7\frac{1}{2} = \frac{112}{130} + 7\frac{65}{130} = 8\frac{47}{26}, \text{ Ans.}$$

$$8. \$2\frac{1}{4} \div 3\frac{1}{2} = \$\frac{9}{4} \times \frac{2}{7} = \$\frac{9}{14}, \text{ cost of 1 lb.}$$

$$\frac{3}{4} \text{ of } \$\frac{9}{14} = \$\frac{27}{56}, \text{ cost of } \frac{3}{4} \text{ lb., Ans.}$$

$$9. 2\frac{1}{10} \div 5\frac{7}{11} = \frac{21}{10} \times \frac{11}{62} = \frac{231}{620}, \text{ Ans.}$$

10.  $10\frac{3}{4} \times 3 = 32\frac{1}{4}$  miles in 1 hour's flight.

$$2\frac{1}{2} \times 32\frac{1}{4} = \frac{5}{2} \times \frac{129}{4} = \frac{645}{8} = 80\frac{5}{8} \text{ miles, Ans.}$$

### Article 424.

1.  $20\frac{7}{12} = 20\frac{70}{120}$ ;  $12\frac{1}{2} = 12\frac{24}{48}$ .

$$20\frac{70}{120} + 12\frac{24}{48} = 32\frac{122}{120}, \text{ sum, Ans.}$$

$$20\frac{70}{120} - 12\frac{24}{48} = 8\frac{21}{120}, \text{ difference, Ans.}$$

2. (1.) A fraction can be divided by a whole number either by dividing its numerator or multiplying its denominator.

(2.) Dividing the numerator is preferable when it can be done without a remainder, since it shortens the process.

$$3. \quad 32\frac{1}{2} \times 5\frac{4}{7} = \frac{164}{5} \times \frac{40}{7} = \frac{1312}{7} = 187\frac{3}{7} \text{ miles, Ans.}$$

$$4. \quad \$84\frac{7}{9} \div 18\frac{1}{2} = \frac{763}{9} \times \frac{4}{75} = \frac{3052}{675} = \$4\frac{242}{675}, \text{ Ans.}$$

$$5. \quad \frac{3}{4} - \frac{5}{7} = \frac{21}{28} - \frac{20}{28} = \frac{1}{28}$$

$$\frac{1}{28} = \$500; \quad \frac{28}{28} = 28 \times \$500 = \$14000, \text{ Ans.}$$

6.  $\frac{1}{3}$  of  $\frac{5}{8} = \frac{5}{24}$ , the part sold.

$$\frac{5}{24} = \$12000; \quad \frac{2400}{5} \times 24 = \$57600, \text{ Ans.}$$

7.  $\frac{2}{3}$  of \$12000 + \$600 = \$9000 + \$600 = \$9600.  
 \$9600 =  $\frac{2}{3}$  of B's money.

$$\frac{\$9600}{\frac{2}{3}} \times 3 = \$12000, \text{ B's money, Ans.}$$

$$8. \frac{4\frac{3}{4} + 3\frac{1}{2}}{8\frac{3}{4} \times 2\frac{5}{8}} = \frac{\frac{14}{3} + \frac{7}{2}}{\frac{35}{4} \times \frac{17}{6}} = \frac{\frac{49}{6}}{\frac{595}{24}} = \frac{49}{\cancel{6}} \times \frac{\cancel{24}}{595} = \frac{196}{595}, \text{ Ans.}$$

9. 100 acres -  $37\frac{1}{2}$  acres =  $62\frac{1}{2}$  acres.

$$\frac{1}{3} \text{ of } 62\frac{1}{2} \text{ acres} = \frac{1}{3} \text{ of } \frac{125}{2} = 12\frac{1}{2} \text{ acres.}$$

$$62\frac{1}{2} \text{ acres} - 12\frac{1}{2} \text{ acres} = 50 \text{ acres, Ans.}$$

10.  $\frac{1}{2}$  of  $\frac{2}{3}$  of  $\frac{7}{8}$  =  $\frac{7}{24}$ , what he sold.

$$\frac{7}{24} = \$32000. \quad \frac{\$32000}{\frac{7}{24}} \times \frac{7}{24} = \$109714\frac{2}{3}, \text{ Ans.}$$

### Article 425.

$$1. \begin{array}{r} 46\frac{2}{3} \\ 49\frac{7}{8} \\ \hline 57\frac{1}{2} \\ 152 \end{array} \quad \frac{5}{8} + \frac{7}{16} + \frac{1}{4} = \frac{10}{16} + \frac{7}{16} + \frac{4}{16} = \frac{21}{16} = 1\frac{5}{16}$$

$$\frac{1\frac{5}{16}}{153\frac{5}{16}}, \text{ Ans.}$$

$$2. 65\frac{3}{8} + 28\frac{7}{8} = 65\frac{3}{8} + 28\frac{7}{8} = 94\frac{1}{2}, \text{ Ans.}$$

$$3. 56 - 24\frac{7}{10} = 31\frac{3}{10}; \quad 41\frac{1}{2} + 31\frac{3}{10} = 73\frac{1}{10}$$

$$73\frac{1}{10} - 41\frac{1}{2} = 31\frac{1}{10}, \text{ Ans.}$$

$$4. \frac{4}{5} \text{ of } 156\frac{3}{4} \times \frac{5}{6} \text{ of } \$54 = \frac{4}{5} \text{ of } \frac{470}{5} \times \frac{5}{6} \text{ of } \$\frac{9}{54} =$$

$$\$5640, \text{ Ans.}$$

$$5. 297\frac{1}{2} \div 33\frac{1}{2} = \frac{595}{2} \times \frac{3}{29} = \frac{255}{29} = 8\frac{13}{29}, \text{ Ans.}$$

$$6. 2\frac{1}{4} \div \frac{3}{8} = \frac{9}{4} \times \frac{8}{3} = 6 \text{ lots, Ans.}$$

$$7. \frac{\frac{3}{8} \times \frac{11}{21}}{\frac{1}{18} \times 5\frac{1}{2}} = \frac{\frac{33}{168}}{\frac{11}{36}} = \frac{3}{168} \times \frac{36}{11} = \frac{9}{14}, \text{ Ans.}$$

$$8. \frac{3}{4} \text{ of } 8 \text{ mi.} = 6 \text{ mi.}$$

$$6 \text{ mi.} = \frac{6}{9} \text{ of } 9 \text{ mi.} = \frac{6}{9}, \text{ or } \frac{2}{3}, \text{ Ans.}$$

$$9. \frac{\$9000}{2} \times 3 = \$13500, \text{ value of the farm.}$$

$$\frac{5}{12} \text{ of } \$13500 = \$5625, \text{ Ans.}$$

$$10. \frac{5}{3} + 2 = \frac{7}{5}; \quad \frac{5}{3} - \frac{7}{5} = \frac{25}{15} - \frac{21}{15} = \frac{4}{15}, \text{ diminished, Ans.}$$

**Article 426.**

$$1. 7\frac{1}{2} - 3\frac{1}{4} = 3\frac{1}{4}; \quad 3\frac{1}{4} \div 14\frac{1}{2} = \frac{133}{40} \times \frac{9}{133} = \frac{9}{40}, \text{ Ans.}$$

$$2. \frac{1}{3} \text{ of a day's work can be had for } \$1; \text{ for } \$2\frac{1}{2} \text{ can be had}$$

$$2\frac{1}{2} \times \frac{1}{3} = \frac{2\frac{1}{2}}{3} = \frac{5}{2} \times \frac{1}{3} = \frac{5}{6} \text{ day, Ans.}$$



$$3. 94 \times 26\frac{2}{3} = 2506\frac{2}{3}; \quad 12000 \div 7\frac{1}{2} = 1548\frac{1}{2}$$

$$2506\frac{2}{3} - 1548\frac{1}{2} = 958\frac{1}{3}, \text{ Ans.}$$

$$4. \frac{4}{63} + \frac{3}{84} = \frac{16}{252} + \frac{9}{252} = \frac{25}{252}, \text{ Ans.}$$

5.

$$\frac{1}{2} \text{ of } \frac{3}{7} = \frac{3}{14}; \quad \frac{7}{8} \times 3\frac{1}{2} = \frac{14}{5}; \quad \frac{14}{5} + \frac{3}{14} = \frac{211}{70}, \text{ denominator.}$$

$$\frac{2}{3} \text{ of } \frac{211}{70} = \frac{211}{105}, \text{ numerator.} \quad \frac{211}{105} \div \frac{211}{70} = \frac{2}{3}, \text{ Ans.}$$

The value of any fraction whose numerator is  $\frac{2}{3}$  of its denominator is  $\frac{2}{3}$ . The solution is unnecessary.

$$6. 6\frac{2}{3} \times 2\frac{4}{5} = \frac{20}{3} \times \frac{21}{5} = \frac{35}{2}; \quad 5\frac{1}{2} \div 3\frac{3}{4} = \frac{16}{3} \times \frac{4}{15} = \frac{64}{45}$$

$$\frac{35}{2} + \frac{64}{45} = \frac{1575}{90} + \frac{128}{90} = 18\frac{8}{9}, \text{ sum.}$$

$$\frac{35}{2} - \frac{64}{45} = \frac{1575}{90} - \frac{128}{90} = 16\frac{7}{9}, \text{ difference.}$$

$$18\frac{8}{9} + 16\frac{7}{9} = 35, \text{ Ans.}$$

$$7. \$2\frac{1}{2} = \frac{5}{2} \div \frac{3}{5} = \frac{25}{6} = \$4\frac{1}{6}, \text{ cost.}$$

$$\$4\frac{1}{6} - \$2\frac{1}{2} = \$1\frac{1}{3}, \text{ loss, Ans.}$$

$$8. \frac{1}{5} \text{ of } 2 \text{ qt., or } \frac{2}{5} \text{ qt.,} + \frac{1}{3} \text{ qt.} = \frac{11}{15} \text{ qt.}$$

$$2 \text{ qt.} - \frac{11}{15} \text{ qt.} = 1\frac{4}{15} \text{ qt., remainder.}$$

$$1\frac{4}{15} \text{ qt.} = \frac{19}{15} \div 3 = \frac{19}{45} \text{ qt., Ans.}$$

$$9. (1.) 24\frac{3}{4} = \frac{99}{4} \times \frac{7}{8} = \frac{693}{32} = 21\frac{21}{32}, \text{ Ans.}$$

$$(2.) 24\frac{3}{4} = \frac{99}{4} \div \frac{7}{8} = \frac{99}{4} \times \frac{8}{7} = \frac{198}{7} = 28\frac{2}{7}, \text{ Ans.}$$

$$(3.) 28\frac{2}{7} - 21\frac{21}{32} = 6\frac{111}{224}, \text{ Ans.}$$

$$10. \frac{\$1760}{3} \times 8 = \frac{14080}{3} = \$4693\frac{1}{3}, \text{ value of farm.}$$

$$\frac{8}{8} - \frac{3}{8} = \frac{5}{8}; \quad \frac{1}{2} \text{ of } \frac{5}{8} = \frac{5}{16}, \text{ B's share.}$$

$$\frac{5}{8} - \frac{5}{16} = \frac{5}{16}, \text{ C's share.}$$

$$\frac{5}{16} \text{ of } \$4693\frac{1}{3}, \text{ or } \$1466\frac{2}{3}, + \$375 = \$1841\frac{2}{3}, \text{ Ans.}$$

### Article 427.

$$1. \frac{9}{48} = \frac{9.0000}{48} = .1875, \text{ Ans.}$$

$$2. \begin{array}{r} .800 \\ .00008 \\ \hline .79992, \text{ Ans.} \end{array}$$

3. Seven and eight thousandths. Nine thousand ninety and nine hundred nine thousandths. Forty-two hundred-thousandths.

$$4. 0.0025 = \frac{25}{10000} = \frac{1}{400}, \text{ Ans.}$$

5. The denominator of a decimal is not expressed, since it is always 1 with as many ciphers as there are decimal figures.

$$6. 49\frac{7}{8} = 49.875; \quad \frac{1}{2} = .5; \quad 3\frac{3}{4} = 3.75$$

$$.5 + 3.75 + 21.125 = 25.375 \text{ yd., what was sold.}$$

$$49.875 \text{ yd.} - 25.375 \text{ yd.} = 24.5 \text{ yd., Ans.}$$

$$7. \frac{3}{8} = .375$$

$$\frac{4}{5} = .8$$

$$\frac{5}{16} = .3125$$

$$\frac{9}{75} = .12$$

$$\overline{1.6075}, \text{ Ans.}$$

$$8. \$1.37\frac{1}{2} \times 240 = \$330, \text{ Ans.}$$

$$9. \$12.56 \div 4 = \$3.14, \text{ cost of 1 bu.}$$

$$\$3.14 \times 9 = \$28.26, \text{ Ans.}$$

$$10. .024 \div .0025 = 9.6$$

$$.016 \times 300 = 4.8$$

$$4.8 \div 9.6 = .5, \text{ Ans.}$$

### Article 428.

$$1. \frac{73}{8000} = 73 \div 8000 = .009125, \text{ Ans.}$$

$$2. .00960 = \frac{960}{100000} = \frac{6}{625}, \text{ Ans.}$$

$$3. 144 \div 12000 = .012; .0144 \div .00012 = 120$$

$$.012 \times 120 = 1.44, \text{ Ans.}$$

$$4. .02 \text{ of } .006 = .00012$$

$$.00012 - .0000023 = .0001177, \text{ Ans.}$$

$$5. 17.28 \div .083\frac{1}{3} = 207.36, \text{ Ans.}$$

$$6. .027\frac{1}{2} = .0275; .36\frac{3}{4} = .3675$$

$$.0275 \times .3675 = .01010625, \text{ Ans.}$$

$$7. \frac{7\frac{1}{2}}{6000} = \frac{15}{2} \times \frac{1}{\cancel{6000}_{400}} = \frac{1}{800} = .00125, \text{ Ans.}$$

8. (1.) By moving the decimal point three orders to the left.  
 (2.) By moving the decimal point two orders to the right.

$$9. 90 \div .03 = 3000, \text{ the number; } 3000 \times .005 = 15, \text{ Ans.}$$

$$10. 1.2 \div .0025 = 480; 480 - .0025 = 479.9975, \text{ Ans.}$$

**Article 429.**

1.  $\frac{3}{40} = .075, \times .0008 = .00006; .00006 \div .02 = .003, \text{Ans.}$

2.  $1000 \div .001 = 1000000$

$1000 \times .001 = 1, \text{product of dividend and divisor.}$

$1 + 1000 + .001 = 1001.001$

$1000000 - 1001.001 = 998998.999, \text{Ans.}$

3.

$.600 \times .00006 = .000036; .000036 \div .02\frac{1}{2} = .00144, \text{Ans.}$

4.  $\$1 + \$2\frac{1}{2} + \$3 + \$5 + \$10 + \$20 = \$41.50$

$\$41.50 \div \$0.25 = 166, \text{Ans.}$

5.  $15280 \text{ bricks} = 15.280 \text{ M.}; 15.280 \times \$40 = \$611.20, \text{cost.}$

$350 = .350 \text{ M., worthless}; 15.280 - .350 = 14.93$

$\$611.20 \div 14.93 = \$40.93\frac{1}{4}\frac{1}{4}, \text{Ans.}$

6.  $\$1500 - \$968 = \$532, \text{what he saves in 1 year.}$

$\$3724 \div \$532 = 7 \text{ years, Ans.}$

7.  $1 - 0.60 = 0.40, \text{what he had left.}$

$.83\frac{1}{2} - .40 = .43\frac{1}{2}; \$130 = .43\frac{1}{2}$

$\frac{\$130}{.43\frac{1}{2}} \times 100 = \$300, \text{Ans.}$

8.  $19375 \text{ ft.} = 19.375 \text{ thousand ft.}$

$\$17.25 \times 19.375 = \$334.21\frac{1}{8}, \text{Ans.}$

9.  $21\frac{1}{2} \text{ yd. carpeting @ } \$1.75 \text{ . . . . . } \$38.06\frac{1}{2}$

$25 \text{ " lining " } 0.12\frac{1}{2} \text{ . . . . . } 3.12\frac{1}{2}$

$2\frac{7}{8} \text{ " silk " } 2.25 \text{ . . . . . } 6.46\frac{7}{8}$

$\frac{3}{4} \text{ " velvet " } 2.87\frac{1}{2} \text{ . . . . . } 2.15\frac{3}{4}$

$\$49.81\frac{1}{4}, \text{Ans.}$

10.  $\$11 \div 4400 = \$0.0025$ , cost of 1 ft.

$\frac{1}{4}$  of  $\$0.0025 = \$0.0006\frac{1}{4}$ .

$\$0.0025 + \$0.0006\frac{1}{4} = \$0.0031\frac{1}{4}$ .

$4400 \text{ ft.} - 1500 \text{ ft.} = 2900 \text{ ft.}$

$\$0.0031\frac{1}{4} \times 2900 = \$9.06\frac{1}{4}$ , Ans.

### Article 430.

1.  $25\frac{5}{8} = 25.3125$ ;  $25.3125 - 15.064 = 10.2485$ , Ans.

2. (1.) A complex fraction is a fraction having a fraction in one or both of its terms. (Art. 133.)

(2.) A mixed decimal is an integer and a decimal. (Art. 139.)

(3.) A denominate number is a number composed of units of one or more denominations. (Art. 184.)

(4.) Reduction is changing denominate numbers from one denomination to another without changing their value.

3. (1.)  $\frac{16}{22} = 16.00000 \div 22 = 0.72727\frac{2}{11}$ , Ans.

(2.)  $0.0875 = \frac{875}{10000} = \frac{7}{80}$ , Ans.

4.  $1 \text{ ft.} \div 3 = \frac{1}{3} \text{ yd.}$ ;  $2\frac{1}{3} \text{ yd., or } \frac{7}{3} \text{ yd.,} \div 5\frac{1}{2} = \frac{14}{33} \text{ rd.}$

$65\frac{1}{3} \text{ rd., or } \frac{2159}{33}, \div 320 = \frac{2159}{10560} = 0.20445\frac{1}{2} \text{ mile, Aus.}$

5.  $0.5473 \text{ lb.} = .5473 \text{ of } 12 \text{ oz.} = 6.5676 \text{ oz.}$

$.5676 \text{ oz.} = .5676 \text{ of } 20 \text{ pwt.} = 11.352 \text{ pwt.}$

$.352 \text{ pwt.} = .352 \text{ of } 24 \text{ gr.} = 8.448 \text{ gr.}$

Ans. 6 oz. 11 pwt. 8.448 gr.

6.  $80 \times 12 \times 4 = 3840 \text{ cu. ft.}$ ;  $3840 \text{ cu. ft.} \div 128 = 30 \text{ cd.}$

$\$5.50 \times 30 = \$165$ , Ans.

$$7. 45 \text{ sq. rd.} \div 160 = \frac{9}{32} \text{ A.}; \quad 260 \text{ A.} + \frac{9}{32} \text{ A.} = 260\frac{9}{32} \text{ A.}$$

$$\$25.75 \times 260\frac{9}{32} = \$6702.24\frac{7}{8}, \text{ Ans.}$$

$$8. 1 \text{ metric ton} = 1000 \text{ kilograms.}$$

$$16.455 \times 1000 = 16455 \text{ kilograms, Ans.}$$

$$9. 5 \text{ oz., or } \frac{5}{16} \text{ lb.,} + 6 \text{ lb.} = 6\frac{5}{16} \text{ lb.}$$

$$\$0.32 \times 6\frac{5}{16} = \$2.02, \text{ cost of coffee.}$$

$$\$3.46 - \$2.02 = \$1.44, \text{ cost of sugar.}$$

$$\$1.44 \div \$0.11 = 13\frac{1}{11} \text{ lb., or } 13 \text{ lb. } 1\frac{1}{11} \text{ oz., Ans.}$$

$$10. 1 \text{ degree} = 69\frac{37}{900} \text{ miles} = \frac{62137}{900} \text{ miles.}$$

$$\frac{62137}{\frac{900}{10}} \times \frac{90}{10} = \frac{62137}{10} = 6213.7 \text{ miles in quadrant.}$$

$$1 \text{ mile} = 63360 \text{ inches.}$$

$$6213.7 \times 63360 = 393700032 \text{ inches.}$$

$$393700032 \div 10000000 = 39.37+ \text{ inches, Ans.}$$

### Article 431.

$$1. \text{ Oct. 11, 1492, to Oct. 11, 1775,} = 283 \text{ y.}$$

$$\text{Oct. 11, 1775, to June 11, 1776,} = 8 \text{ mo.}$$

$$\text{June 11, 1776, to July 4, 1776,} = 23 \text{ d.}$$

$$\text{Oct. 11, 1492, to July 4, 1776,} = 283 \text{ y. } 8 \text{ mo. } 23 \text{ d., Ans.}$$

$$2. 104 \text{ A. } 117 \text{ sq. rd.}$$

$$\begin{array}{r} 87 \quad 78 \\ \hline \end{array}$$

$$192 \text{ A. } 35 \text{ sq. rd., area of both farms.}$$

$$\begin{array}{r} 40 \quad 40 \\ \hline \end{array}$$

$$3 \text{ ) } 151 \text{ A. } 155 \text{ sq. rd., remainder.}$$

$$50 \text{ A. } 105 \text{ sq. rd., Ans.}$$

$$3. 40 \text{ min.} = \frac{40}{60} = \frac{2}{3} \text{ h.}$$

$$24 \div \frac{2}{3} = 36$$

$$16 \text{ mi. } 25 \text{ rd. } 12 \text{ ft.}$$

$$36$$

$$\hline 578 \text{ mi. } 286 \text{ rd. } 3 \text{ ft., Ans.}$$

$$4. 5 \text{ h. } 55 \text{ min.}$$

$$\begin{array}{r} 15 \\ 88^\circ 45', \text{ Ans.} \end{array}$$

$$5. 39 \text{ T. } 1625 \text{ lb.} = 79625 \text{ lb.}; 79625 \div 85 = 936\frac{1}{2} \text{ lb., Ans.}$$

$$6. \quad \begin{array}{r} 2^\circ \quad 30' \quad 20'' \\ \quad \quad \quad 5 \\ \hline 12^\circ \quad 31' \quad 40'' \end{array}$$

$$\begin{array}{r} 71^\circ \quad 0' \quad 0'' \\ 12 \quad 31 \quad 40 \\ \hline \end{array}$$

$$\text{Ans. } 58^\circ 28' 20'', \text{ West.}$$

7. (1.) A square is a rectangle with equal sides.

(2.) A rectangle is a plane surface with four straight sides and four right angles.

(3.) A cube is a solid bounded by six equal squares. (Art. 170.)

(4.) A solid is that which has length, breadth, and thickness. (Art. 169.)

8. The year 1880 = 366 days. The year 1881 = 365 days.

$$365 + 366 = 731 \text{ days. } 4 \text{ min.} \times 731 = 2924 \text{ min.}$$

$$2924 \text{ min.} = 2 \text{ d. } 0 \text{ h. } 44 \text{ min., Ans.}$$

9.  $32 \text{ ft.} \times 3.1416 = 100.5312 \text{ ft., circumference of field.}$

$$100.5312 \text{ ft.} \div 4 = 25.1328 \text{ ft., on 1 side of square.}$$

$$25.1328^2 = 631.65763584 \text{ sq. ft., area of square field.}$$

$$631.65763 + \text{sq. ft.} = 2.32 + \text{sq. rd., Ans.}$$

10.  $24 \text{ ft. } 6 \text{ in.} = \frac{4}{3} \text{ ft.}; 20 \text{ ft. } 9 \text{ in.} = \frac{8}{3} \text{ ft.}; 8 \text{ in.} = \frac{2}{3} \text{ ft.}$

$$\frac{49}{2} \times \frac{83}{4} \times \frac{2}{3} = \frac{4067}{12} = 338\frac{1}{2} \text{ cu. ft.}$$

$$\frac{11}{12} \times 1728 = 1584 \text{ cu. in.}$$

$$\text{Ans. } 338 \text{ cu. ft. } 1584 \text{ cu. in.}$$

**Article 432.**

$$1. (14 \text{ ft.} + 16 \text{ ft.}) \times 2 = 60 \text{ ft.}$$

$$60 \times 8 = 480 \text{ sq. ft., surface of walls.}$$

$$\frac{8}{8} - \frac{1}{8} = \frac{7}{8}; \quad \frac{7}{8} \text{ of } 480 \text{ sq. ft.} = 420 \text{ sq. ft.}$$

$$420 \div 1\frac{1}{2} = 280 \text{ ft., length of paper.}$$

$$280 \text{ ft.} = 93\frac{1}{3} \text{ yd.}$$

$$93\frac{1}{3} \text{ yd.} \div 8 \text{ yd.} = 11\frac{2}{3} \text{ rolls, Ans.}$$

$$2. \quad \frac{4}{5} \text{ of } 29\frac{1}{3} = \frac{4}{5} \text{ of } \frac{88}{3} = \frac{352}{15}; \quad 2\frac{7}{8} = \frac{23}{8} \times \frac{\overset{44}{\cancel{352}}}{15} = \frac{1012}{15}$$

$$\frac{3}{11} \text{ of } 8 = \frac{24}{11}; \quad 4\frac{5}{8} = \frac{29}{8} \times \frac{\overset{4}{\cancel{24}}}{11} = \frac{116}{11}$$

$$\frac{1012}{15} \div \frac{116}{11} = \frac{\overset{253}{\cancel{1012}}}{15} \times \frac{11}{\underset{29}{\cancel{116}}} = \frac{2783}{435} = 6\frac{1}{3}\frac{2}{3}, \text{ Ans.}$$

$$3. \quad \frac{3}{5} \times 12 = \frac{36}{5} = 7\frac{1}{5} \text{ gross}; \quad \frac{1}{5} \times 12 = \frac{12}{5} = 2\frac{2}{5} \text{ dozen.}$$

$$\text{Ans. } 7 \text{ gross, } 2\frac{2}{5} \text{ dozen.}$$

4.

$$8 \times 4 \times 2 = 64 \text{ sq. in.}; \quad 8 \times 2 \times 2 = 32 \text{ sq. in.}$$

$$4 \times 2 \times 2 = 16 \text{ sq. in.}$$

$$64 \text{ sq. in.} + 32 \text{ sq. in.} + 16 \text{ sq. in.} = 112 \text{ sq. in., surface of 1 brick.}$$

$$112 \text{ sq. in.} \times 15 = 1680 \text{ sq. in., Ans.}$$

$$5. \quad \text{May } 7 + 275 \text{ d.} = 24 + 30 + 31 + 31 + 30 + 31 + 30 + 31 + 31 + 6 = 275 \text{ d.} = \text{Feb. 6, Ans.}$$



$$6. 1 \text{ pt.} \div 2 = \frac{1}{2} \text{ qt.}; \quad 3\frac{1}{2} \text{ qt.} = \frac{7}{2} \div 4 = \frac{7}{8} \text{ gal.}$$

$$17 \text{ gal.} + \frac{7}{8} = 17\frac{7}{8} \text{ gal.} \quad \$0.45 \times 17\frac{7}{8} = \$8.04\frac{3}{8}, \text{ Ans.}$$

$$7. \frac{3.75 \times 48.34\frac{1}{2}}{.5\frac{1}{2}} = \frac{181.29375}{.5125} = 353.7\frac{1}{4}, \text{ Ans.}$$

$$8. 1 \text{ mile} = 5280 \text{ ft.}; \quad \frac{1}{2} \text{ mile} = \frac{1}{2} \text{ of } 5280 \text{ ft.} = 2640 \text{ ft.}$$

$$2640 \times 60 = 158400 \text{ sq. ft.}; \quad 1 \text{ A.} = 43560 \text{ sq. ft.}$$

$$158400 \text{ sq. ft.} \div 43560 = 3\frac{4}{11} \text{ A., Ans.}$$

$$9. 30000 \text{ cu. ft.} \div 10 \text{ ft.} = 3000 \text{ sq. ft.} = 333\frac{1}{3} \text{ sq. yd.}$$

$$\$0.75 \times 333\frac{1}{3} = \$250, \text{ Ans.}$$

$$10. 3 \text{ in.} = \frac{3}{36} = \frac{1}{12} \text{ yd.}; \quad \frac{25}{300} \times \frac{1}{12} = 25 \text{ sq. yd., Ans.}$$

### Article 433.

$$1. 8 \text{ rd.} = 8 \times 16\frac{1}{2} = 132 \text{ ft.}; \quad 132 \times 10 = 1320 \text{ sq. ft.}$$

$$\$0.60 \times 1320 = \$792, \text{ what he sold it for.}$$

$$\$792 - \$660 = \$132, \text{ gain, Ans.}$$

$$2. 4 \text{ qt.} = 4 \div 8 = \frac{1}{2} \text{ pk.}; \quad 3\frac{1}{2} \text{ pk.} = \frac{7}{2} \div 4 = \frac{7}{8} \text{ bu.}$$

$$7 + \frac{7}{8} = 7\frac{7}{8} \text{ bu.}; \quad \$4.80 \times 7\frac{7}{8} = \$37.80, \text{ Ans.}$$

$$3. 30 \text{ yd.} \times \frac{3}{4} \text{ yd.} = 22\frac{1}{2} \text{ sq. yd.} = 202\frac{1}{2} \text{ sq. ft.}$$

$$202\frac{1}{2} \text{ sq. ft.} \div 15 = \frac{27}{2} \times \frac{1}{15} = \frac{27}{2} = 13\frac{1}{2} \text{ ft., Ans.}$$

4. 1 acre = 43560 sq. ft. ;  $\frac{1}{2}$  acre =  $\frac{1}{2}$  of 43560 = 21780 sq. ft.

$\$0.30 \times 21780 = \$6534$ , what  $\frac{1}{2}$  was sold for.

$\frac{1}{2}$  of  $\$300 = \$150$ , what  $\frac{1}{2}$  was bought for.

$\$6534 - \$150 = \$6384$ , gain, Ans.

5. 0.24 lb. =  $.24 \times 16$  oz. = 3.84 oz.

$3.84$  oz. + 7 oz. = 10.84 oz., Ans.

6. 12750 ft. = 12.75 thousand ft.

$\$27.50 \times 12.75 = \$350.625$ , Ans.

7.  $132 \times 66 = 8712$  sq. ft. ; 1 acre = 43560 sq. ft.

$$\frac{8712}{43560} = \frac{1}{5} \text{ acre, Ans.}$$

8. 124 bu. 0 pk. 7 qt. = 3975 qt. ; 2 bu. 1 pk. 3 qt. = 75 qt.

$3975 \div 75 = 53$  bags, Ans.

9. 3 P.M. March 1, 1881, = 1881 y. 60 d. 15 h.

1881 y. 60 d. 15 h.

1876      7      9

---

5 y. 53 d. 6 h.

3 y. =  $3 \times 365$  d. = 1095 d. ; 2 l.y. =  $2 \times 366$  d. = 732 d.

$1095$  d. +  $732$  d. +  $53$  d. = 1880 d.      Ans. 1880 d. 6 h.

10.  $125$  ft.  $\times$   $75$  ft. = 9375 sq. ft.

1 A. 46 sq. rd.  $18\frac{1}{2}$  sq. yd. = 56250 sq. ft.

$56250 \div 9375 = 6$  lots, Ans.

**Article 434.**

- 1.
- $198 \text{ rd.} \times 150 \text{ rd.} = 29700 \text{ sq. rd., area of farm.}$

$$29700 \text{ sq. rd.} \div 160 = 185\frac{5}{8} \text{ acres.}$$

$$\$32 \times 185\frac{5}{8} = \$5940, \text{ Ans.}$$

- 2.
- $\frac{(16 \text{ in.} + 9 \text{ in.})}{2} = 12\frac{1}{2} \text{ in., mean width (Art. 229).}$

$$12\frac{1}{2} \text{ in.} \div 12 = 1\frac{1}{24} \text{ ft.; } 12 \times 1\frac{1}{24} = 12\frac{1}{2} \text{ board ft.}$$

$$12\frac{1}{2} \div 1000 = .012\frac{1}{2} \text{ thousand ft.}$$

$$\$30 \times .012\frac{1}{2} = \$0.37\frac{1}{2}, \text{ Ans.}$$

- 3.
- $1 \text{ acre} = 43560 \text{ sq. ft.; } 6 \text{ in.} = \frac{1}{2} \text{ ft.}$

$$43560 \times \frac{1}{2} = 21780 \text{ cu. ft., Ans.}$$

- 4.
- $2\frac{1}{2} \text{ in.} \div 12 = \frac{1}{8} \text{ ft.; } 167 \times \frac{3}{16} = \frac{501}{16} = 31\frac{5}{16} \text{ sq. ft.}$

$$31\frac{5}{16} \text{ sq. ft.} \div 9 = 3\frac{23}{8} \text{ sq. yd., Ans.}$$

- 5.
- $1 \text{ acre} = 43560 \text{ sq. ft.; } 43560 \div 50 = 871\frac{1}{5} \text{ ft., Ans.}$

- 6.
- $(13 \text{ ft.})^3 = 2197 \text{ cu. ft.; } 8 \times 4 \times 2 = 64 \text{ cu. in. in 1 brick.}$

$$1728 \text{ cu. in.} \div 64 \text{ cu. in.} = 27 \text{ bricks in 1 cu. ft.}$$

$$2197 \times 27 = 59319 \text{ bricks, Ans.}$$

- 7.
- $11 \text{ min. } 11 \text{ sec.} = 11\frac{1}{6} \text{ min.}$

$$11\frac{1}{6} \text{ or } \frac{671}{60} \div 2 = \frac{671}{120} \text{ min. to sail 1 mile.}$$

$$\frac{993}{2979} \times \frac{671}{120} = \frac{666303}{40} \text{ min. to sail 2979 miles.}$$

$$\frac{666303}{40} \text{ min.} = \frac{666303}{40} \div 60 = \frac{222101}{800} \text{ hours.}$$

$$\frac{222101}{800} \text{ h.} = \frac{222101}{800} \div 24 = 11\frac{11055}{8000}, \text{ days, Ans.}$$

8.  $50 \text{ ft.} \times 5 = 250 \text{ ft.}$

$250 \text{ ft.} \times 2 = 500 \text{ ft.}$

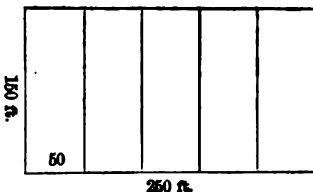
5 lots will require 6 sections  
of fence.

$150 \text{ ft.} \times 6 = 900 \text{ ft.}$

$500 \text{ ft.} + 900 \text{ ft.} = 1400 \text{ ft. of}$   
fence.

$1400 \times 4 = 5600 \text{ bd. ft., Ans.}$

$5600 \div 1000 = 5.60 \text{ thousand ft.; } \$16 \times 5.60 = \$89.60 \text{ Ans.}$



9.  $1\frac{1}{2} \text{ pt., or } \frac{2}{3} \div 2 = \frac{3}{4} \text{ qt.; } 3\frac{3}{4} \text{ qt., or } \frac{15}{4}, \div 4 = \frac{15}{16} \text{ gal.}$

$\frac{15}{16} \text{ of } \$240 = \$225, \text{ actual worth, Ans.}$

$\$240 - \$225 = \$15, \text{ gain, Ans.}$

10.  $17 \text{ ft. } 8 \text{ in.} = \frac{53}{3} \text{ ft.; } 8 \text{ ft. } 3 \text{ in.} = \frac{33}{4} \text{ ft.}$

$\frac{53}{3} \times \frac{11}{8} \times \frac{2}{3} = 1166 \text{ cu. ft.; } 1166 \text{ cu. ft.} \div 128 = 9\frac{7}{8} \text{ cu.}$

$\$8.32 \times 9\frac{7}{8} = \$75.79, \text{ Ans.}$

### Article 435.

1.  $12 \times 16\frac{1}{2} \text{ ft.} = 198 \text{ ft.; } 198 \times 110 = 21780 \text{ sq. ft.}$

1 acre = 43560 sq. ft.

$21780 \text{ sq. ft.} = \frac{21780}{43560} = \frac{1}{2} \text{ acre, Ans.}$

2. 1 mile = 63360 in.;  $63360 \div 39.37 = 1609.3 \text{ m, Ans.}$

3. 1 cubic meter of water = 1 metric ton.

1 cubic meter of gold = 19.35 metric tons.

1 metric ton = 1000 kilograms.

$19.35 \times 1000 = 19350 \text{ kilograms, Ans.}$

$$4. \quad 3 \text{ in.} \div 12 = \frac{1}{4} \text{ ft.}; \quad 2\frac{1}{4} \text{ ft.} = \frac{9}{4} \div 3 = \frac{3}{4} \text{ yd.}$$

$$25 \text{ yd.} + \frac{3}{4} \text{ yd.} = 25\frac{3}{4} \text{ yd.}$$

$$\$0.25 \times 25\frac{3}{4} = \$6.43\frac{3}{4}, \text{ Ans.}$$

$$5. \quad .875 \text{ mi.} = .875 \text{ of } 320 \text{ rd.} = 280 \text{ rd.}$$

$$\$5 \div 2\frac{1}{2} = \$2, \text{ cost of 1 rd.}$$

$$\$2 \times 280 = \$560, \text{ Ans.}$$

6. The length of a meter in inches (39.37 in.) multiplied by 10000000 will give the length of a quadrant, or  $90^\circ$ , in inches;  $\frac{1}{10}$  of this product will give the length of a degree of latitude in inches, which may be changed to miles by dividing by 63360.

$$7. \quad 40 \text{ cu.} \times 128 = 5120 \text{ cu. ft.}; \quad 8 \text{ ft.} \times 4 \text{ ft.} = 32 \text{ sq. ft.}$$

$$5120 \div 32 = 160 \text{ ft., length of pile, Ans.}$$

$$8. \quad (56 + 25), \text{ or } 81 \text{ ft.,} \times 2 = 162 \text{ ft., length of the four walls.}$$

$$162 \times 30 = 4860 \text{ board ft.}$$

$$4860 \text{ bd. ft.} \div 1000 = 4.86 \text{ thousand ft.}$$

$$\$10 \times 4.86 = \$48.60, \text{ Ans.}$$

$$9. \quad 8 \text{ ft.} \times 225 \text{ ft.} = 1800 \text{ sq. ft.}; \quad 10 \text{ ft.} \times 90 \text{ ft.} = 900 \text{ sq. ft.}$$

$$\$30 \div 900 = \$0.03\frac{1}{3}, \text{ cost of 1 sq. ft.}$$

$$\$0.03\frac{1}{3} \times 1800 = \$60, \text{ Ans.}$$

$$10. \quad 145 \text{ rd.} \div 320 = \frac{145}{320} = \frac{29}{64} \text{ mi.}$$

$$25 \text{ mi.} + \frac{29}{64} \text{ mi.} = 25\frac{29}{64} \text{ mi.}$$

$$\$700 \times 25\frac{29}{64} = \$17817.18\frac{29}{64}, \text{ Ans.}$$

**Article 436.**

1.  $14 \text{ ft. } 9 \text{ in.} = 14\frac{3}{4} \text{ ft.}$

$16 \times 14\frac{3}{4} = 236 \text{ sq. ft., area of room.}$

$236 \text{ sq. ft.} \div 9 = \frac{236}{9} \text{ sq. yd.}$

$\frac{236}{9} \div \frac{3}{4} = \frac{944}{27} = 34\frac{16}{27} \text{ yd., Ans.}$

2.  $\frac{1}{4} \text{ A.} = \frac{43560}{4} \text{ sq. ft.} = 10890 \text{ sq. ft.}$

$4\frac{1}{2} \text{ in.} = \frac{9}{2} \div 12 = \frac{3}{8} \text{ ft.; } \frac{5445}{10890} \times \frac{3}{8} = \frac{16335}{4} \text{ cu. ft.}$

$\frac{16335}{4} \div 27 = \frac{16335}{108} = 151\frac{1}{4} \text{ cu. yd., Ans.}$

3.  $8\frac{1}{2} \text{ mi.} + 10\frac{1}{2} \text{ mi.} = 19\frac{1}{2} \text{ mi.; } 4 \text{ h. } 40 \text{ min.} = 4\frac{2}{3} \text{ h.}$

$19\frac{1}{2} \times 4\frac{2}{3} = \frac{155}{8} \times \frac{14}{3} = \frac{1085}{12} = 90\frac{5}{12} \text{ mi.}$

$120 \text{ mi.} - 90\frac{5}{12} \text{ mi.} = 29\frac{7}{12} \text{ mi., Ans.}$

4.  $1 \text{ mi.} = 5280 \text{ ft.; } 575\frac{1}{2} = \frac{575\frac{1}{2}}{5280} = \frac{307}{8} \times \frac{1}{5280} = \frac{307}{2816}$   
 $\frac{307}{2816} = .109\frac{7}{352} \text{, Ans.}$

5.  $62\frac{1}{2} \text{ lb.} \times 19.25 = 1203.125 \text{ lb. in } 1 \text{ cu. ft. of gold.}$

$1203.125 \times 7000 = 8421875 \text{ gr. troy.}$

Hence 1 cu. ft. of gold weighs 8421875 gr. troy.

$8421875 \div 1728 = 4873\frac{1331}{1728} \text{ gr., Ans.}$

6.  $71200 \text{ lb.} \div 2000 = 35.6 \text{ tons.}$

$\$22 \times 35.6 = \$783.20$ , value of the hay.

$19625 \text{ ft.} \div 1000 = 19.625 \text{ thousand ft.}$

$\$15 \times 19.625 = \$294.375$ , value of the boards.

$\$783.20 - \$294.375 = \$488.82\frac{1}{2}$ , Ans.

7.  $40 \text{ min.} = \frac{40}{60} = \frac{2}{3} \text{ h.}; \quad 4 \text{ h.} \div \frac{2}{3} \text{ h.} = 6$

$16 \text{ mi.} \quad 25 \text{ rd.} \quad 12 \text{ ft.}$

$6$

Ans.  $\overline{96 \text{ mi.} \quad 154 \text{ rd.} \quad 6 \text{ ft.}}$

8.  $39 \text{ T.} \quad 16 \text{ cwt.} \quad 35 \text{ lb.} = 79635 \text{ lb.}$

$79635 \text{ lb.} \div 67 = 1188\frac{3}{7} \text{ lb., Ans.}$

9.  $4 \text{ h.} \quad 44 \text{ min.}$

$15$

$\overline{71^\circ \quad 0'}$ , Ans.

10.  $18 \text{ ft.} \quad 8 \text{ in.} = 18\frac{2}{3} = \frac{56}{3} \text{ ft.}; \quad 10 \text{ ft.} \quad 6 \text{ in.} = 10\frac{1}{2} = \frac{21}{2} \text{ ft.}$

$\frac{28}{3} \quad \frac{7}{2}$

$\frac{56}{3} \times \frac{21}{2} = 196 \text{ sq. ft.}; \quad 196 \div 9 = 21\frac{2}{3} \text{ sq. yd.}$

$21\frac{2}{3} \div \frac{3}{4} = \frac{196}{9} \times \frac{4}{3} = \frac{784}{27} = 29\frac{1}{27} \text{ yd.}$

$\$2 \times 29\frac{1}{27} = \$58.07\frac{1}{27}$ , cost of the \$2 carpeting.

$21\frac{2}{3} \div 1 = 21\frac{2}{3} \text{ yd.}$

$\$1.75 \times 21\frac{2}{3} = \$38.11\frac{1}{3}$ , cost of the \$1.75 carpeting.

$\$58.07\frac{1}{27} - \$38.11\frac{1}{3} = \$19.96\frac{2}{27}$

The \$2 carpet is  $\$19.96\frac{2}{27}$  more expensive.

**Article 437.**

1.  $24 \times 160 \text{ sq. rd.} = 3840 \text{ sq. rd.}$

$$3840 \text{ sq. rd.} \div 80 = 48 \text{ rd., Ans.}$$

2.  $25 \text{ rd. square} = 25 \times 25 = 625 \text{ sq. rd.}$

$$625 \text{ sq. rd.} - 25 \text{ sq. rd.} = 600 \text{ sq. rd., Ans.}$$

3.  $50 \times 20 \times 12 = 12000 \text{ cu. ft.}$

$$58.5 \text{ lb.} \times 12000 = 702000 \text{ lb.}$$

$$702000 \text{ lb.} \div 2000 = 351 \text{ T., Ans.}$$

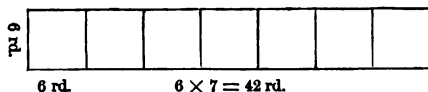
4.  $15^\circ \text{ of longitude} = 1 \text{ hour of time.}$

Hence, 
$$\begin{array}{r} 15 \overline{) 4^\circ 40'} \\ \text{Ans. } 0 \text{ h. } 18 \text{ min. } 40 \text{ sec.} \end{array}$$

5.  $5 \text{ T. } 9 \text{ cwt. } 75 \text{ lb.} = 175600 \text{ oz.}$

$$\$0.01 \times 175600 = \$1756, \text{ Ans.}$$

6. 7 lots will require 8 sections of fence each 6 rd. long, and two sections each 42 rd.



$$6 \text{ rd.} \times 8 = 48 \text{ rd.; } 42 \text{ rd.} \times 2 = 84 \text{ rd.}$$

$$48 \text{ rd.} + 84 \text{ rd.} = 132 \text{ rd. of fence.}$$

$$\$2.37\frac{1}{2} \times 132 = \$313.50, \text{ Ans.}$$

7.  $12 \times 8 \times 6 = 576 \text{ cu. ft.; } 576 \text{ cu. ft.} \div 128 = 4\frac{1}{2} \text{ cd.}$

$$\$4.50 \times 4\frac{1}{2} = \$20.25, \text{ Ans.}$$

8.  $7 \text{ mi. } 190 \text{ rd.} = 40095 \text{ ft.}$

$$\frac{25000}{40095} = \frac{5000}{8019} = .6235\frac{1534}{8019}, \text{ Ans.}$$



$$9. 2435 \text{ lb.} + 2150 \text{ lb.} + 1735 \text{ lb.} + 3462 \text{ lb.} = 9783 \text{ lb.}$$

$$9783 \text{ lb.} \div 2000 = 4.8915 \text{ tons.}$$

$$\$5.25 \times 4.8915 = \$25.68_{\frac{3}{8}}, \text{ Ans.}$$

$$10. 15 \text{ in.} = \frac{15}{12} = \frac{5}{4} \text{ ft.}$$

$$100 \text{ ft.} + 75 \text{ ft.} = 175 \text{ ft., length of walk.}$$

$$175 \times \overset{2}{8} \times \frac{5}{4} = 1750 \text{ cu. ft.}$$

$$8 \times \overset{2}{8} \times \frac{5}{4} = 80 \text{ cu. ft. in corner.}$$

$$1750 \text{ cu. ft.} + 80 \text{ cu. ft.} = 1830 \text{ cu. ft., Ans.}$$

### Article 438.

$$1. 6\frac{1}{4}\% = \frac{6\frac{1}{4}}{100} = \frac{25}{4} \times \frac{1}{\underset{4}{100}} = \frac{1}{16}.$$

$$12\frac{1}{2}\% = \frac{12\frac{1}{2}}{100} = \frac{25}{2} \times \frac{1}{\underset{4}{100}} = \frac{1}{8}.$$

$$8\frac{1}{3}\% = \frac{8\frac{1}{3}}{100} = \frac{25}{3} \times \frac{1}{\underset{4}{100}} = \frac{1}{12}.$$

$$16\frac{2}{3}\% = \frac{16\frac{2}{3}}{100} = \frac{50}{3} \times \frac{1}{\underset{2}{100}} = \frac{1}{6}.$$

$$66\frac{2}{3}\% = \frac{66\frac{2}{3}}{100} = \frac{\overset{2}{200}}{3} \times \frac{1}{100} = \frac{2}{3}.$$

$$\begin{aligned}
 2. \quad \frac{7}{50} &= \frac{7}{50} \text{ of } 100\% = 14\%; & \frac{11}{25} &= \frac{11}{25} \text{ of } 100\% = 44\%. \\
 \frac{2}{5} &= \frac{2}{5} \text{ of } 100\% = 40\%; & \frac{7}{8} &= \frac{7}{8} \text{ of } 100\% = 87\frac{1}{2}\%. \\
 \frac{3}{5} &= \frac{3}{5} \text{ of } 100\% = 60\%; & \frac{5}{7} &= \frac{5}{7} \text{ of } 100\% = 71\frac{4}{7}\%. \\
 \frac{25}{40} &= \frac{25}{40} \text{ of } 100\% = 62\frac{1}{2}\%.
 \end{aligned}$$

3.

- (1.) Percentage treats of computing in hundredths. (Art. 235.)  
 (2.) The base is the number of which the hundredths are taken. (Art. 237.)  
 (3.) The rate per cent is the number of hundredths. (Art. 236.)

$$4. \quad 75\% \text{ of } 60\% = .45 = \frac{45}{100} = \frac{9}{20}, \text{ Ans.}$$

$$\begin{aligned}
 5. \quad 87\frac{1}{2}\% \text{ of } \$5000 &= \$5000 \times .87\frac{1}{2} = \$4375. \\
 0.87\frac{1}{2}\% \text{ of } \$5000 &= \$5000 \times .0087\frac{1}{2} = \$43.75. \\
 \$4375 - \$43.75 &= \$4331.25, \text{ Ans.}
 \end{aligned}$$

$$\begin{aligned}
 6. \quad 37\frac{1}{2}\% &= \frac{3}{8}; \quad \frac{3}{8} \text{ of } 24 \text{ h.} = 9 \text{ h.}; \quad 1 \text{ h.} = 15^\circ \text{ of longitude.} \\
 9 \text{ h.} &= 9 \times 15^\circ = 135^\circ, \text{ Ans.}
 \end{aligned}$$

$$7. \quad 33\frac{1}{3}\% = \frac{1}{3}; \quad \frac{1}{3} \text{ of } \frac{1}{3} = \frac{1}{9}; \quad 25\% = \frac{1}{4}; \quad \frac{1}{4} \text{ of } \frac{1}{4} = \frac{1}{16}.$$

$$\frac{1}{9} - \frac{1}{16} = \frac{16}{144} - \frac{9}{144} = \frac{7}{144}; \quad \$700 = \frac{7}{144}.$$

$$\frac{\frac{100}{\$700}}{7} \times 144 = \$14400, \text{ Ans.}$$

8.  $100\% + 25\% = 125\%$  ;  $\$5000 = 125\%$ .

$$\frac{\$5000}{125} \times 100 = \$4000, \text{ cost of house.}$$

$$\$6000 - \$4000 = \$2000, \text{ gain.}$$

$$\frac{2000}{4000} = \frac{1}{2}; \frac{1}{2} \text{ of } 100\% = 50\% \text{ gain, Ans.}$$

9.  $100\% + \frac{3}{8}\% = 100\frac{3}{8}\%$  ;  $\$12000 = 100\frac{3}{8}\%$ .

$$\frac{\$12000}{100\frac{3}{8}} \times 100 = \$11955.17, \text{ sum expended.}$$

$$\$12000 - \$11955.17 = \$44.83, \text{ brokerage.}$$

10.  $\frac{3}{4} - \frac{2}{3} = \frac{9}{12} - \frac{8}{12} = \frac{1}{12}$  ;  $\frac{1}{12} = \$1200$ .

$$\frac{12}{12} = 12 \times \$1200 = \$14400.$$

$$62\frac{1}{2}\% \text{ of } \$14400 = \$9000, \text{ Ans.}$$

### Article 439.

1.  $100\% - 15\% = 85\%$  ;  $37\frac{1}{2}\% = \frac{3}{8}$  ;  $\frac{3}{8} \text{ of } 85\% = 31\frac{7}{8}\%$ .

$$85\% - 31\frac{7}{8}\% = 53\frac{1}{8}\%, \text{ remainder.}$$

$$53\frac{1}{8}\% \text{ of } \$5420 = \$2879.37\frac{1}{2}, \text{ Ans.}$$

2.  $\$4563.20 \div 160 = \$28.52$ , received for 1 acre.

$$100\% - 8\% = 92\% ; \$28.52 = 92\%.$$

$$\frac{\$28.52}{92} \times 100 = \$31, \text{ Ans.}$$

3.  $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$ .

$$\$45337.50 = 102\frac{1}{2}\% \text{ of the investment.}$$

$$\frac{\$45337.50}{102\frac{1}{2}} \times 100 = \$44231.70\frac{3}{4}, \text{ sum invested.}$$

$$\$45337.50 - \$44231.70\frac{3}{4} = \$1105.79\frac{1}{4}, \text{ commission, Ans.}$$

4.  $87\frac{1}{2}\%$  of \$1800 = \$1575

\$1575  $\times$  .01 $\frac{2}{3}$  = \$26.25, premium, Ans.

5.  $\frac{3}{5}$  of 75% =  $\frac{225}{5}$  = 45%;  $\frac{2}{3}$  of 90% = 60%.

$\frac{45}{60}$  =  $\frac{3}{4}$ ;  $\frac{3}{4}$  of 100% = 75%, Ans.

6. 45% =  $\frac{45}{100}$  =  $\frac{9}{20}$ ;  $\frac{9}{20}$  of  $\frac{3}{4}$  =  $\frac{27}{80}$ , part of the ship sold.

\$36000 = value of  $\frac{27}{80}$  of the ship.

$\frac{\$36000}{27} \times 80$  = \$106666 $\frac{2}{3}$ , value of the ship.

$\frac{3}{4} - \frac{27}{80} = \frac{60}{80} - \frac{27}{80} = \frac{33}{80}$ , what he still owned.

$\frac{33}{80}$  of \$106666 $\frac{2}{3}$  = \$44000, value of  $\frac{33}{80}$ , Ans.

7. 1 mi. = 5280 ft.; 124 rd. 2 yd. 2 $\frac{1}{2}$  ft. = 2054 $\frac{1}{2}$  ft.

$\frac{2054\frac{1}{2}}{5280} = \frac{4109}{10560}$  of 100% = 38 $\frac{4}{5}$  $\frac{1}{8}$ %, Ans.

8. 100% - 40% = 60%; 75% =  $\frac{3}{4}$ ;  $\frac{3}{4}$  of 60% = 45%.

\$4800 = 45% of his debts.

$\frac{\$4800}{45} \times 100$  = \$10666.66 $\frac{2}{3}$ , Ans.

9. 100% + 2 $\frac{1}{2}$ % = 102 $\frac{1}{2}$ %.

\$3675 = 102 $\frac{1}{2}$ % of the investment.

$\frac{\$3675}{102\frac{1}{2}} \times 100$  = \$3585.36 $\frac{4}{5}$ , sum invested.

\$3675 - \$3585.36 $\frac{4}{5}$  = \$89.63 $\frac{1}{5}$ , commission, Ans.

10. \$92.80  $\div$  .03 $\frac{1}{2}$  = \$2784, value of goods.

\$2784 + \$92.80 = \$2876.80, remittance.

**Article 440.**

$$1. \frac{3}{8} \div \frac{5}{9} = \frac{3}{8} \times \frac{9}{5} = \frac{27}{40}; \frac{27}{40} \text{ of } 100\% = 67\frac{1}{2}\%, \text{ Ans.}$$

$$2. \frac{45000}{67500} = \frac{2}{3} \text{ of } 100\% = 66\frac{2}{3}\%, \text{ Ans.}$$

$$3. 110\% \text{ of } \$200 = \$220, \text{ selling price.}$$

$$100\% - 10\% = 90\%.$$

$$\$220 = 90\% \text{ of asking price.}$$

$$\frac{\$220}{90} \times 100 = \$244\frac{4}{9}, \text{ asking price.}$$

$$4. \$1000 \div .02\frac{1}{2} = \$40000, \text{ Ans.}$$

5. If  $\frac{3}{4}$  of a barrel is sold for  $\frac{1}{2}$  of the cost of a barrel,  $\frac{3}{4}$  of a barrel will be sold for  $3 \times \frac{1}{2}$  of  $\frac{1}{2}$  of the cost of a barrel, or  $\frac{3}{4}$  of the cost. The gain is, therefore,  $\frac{1}{4}$  the cost, or 20%.

$$6. 10\% \text{ of } \$2500 = \$250, \text{ gain; } \$2500 + \$250 = \$2750.$$

$$90\% \text{ of } \$2750 = \$2475, \text{ received for the prints.}$$

$$\$2500 - \$2475 = \$25, \text{ loss, Ans.}$$

$$7. \$450 = 125\% \text{ of cost of 1st horse.}$$

$$\frac{\$450}{125} \times 100 = \$360, \text{ cost of 1st horse.}$$

$$\$450 = 75\% \text{ of cost of 2d horse.}$$

$$\frac{\$450}{75} \times 100 = \$600, \text{ cost of 2d horse.}$$

$$\$450 + \$450 = \$900, \text{ received for both horses.}$$

$$\$360 + \$600 = \$960, \text{ cost of both horses.}$$

$$\$960 - \$900 = \$60, \text{ loss.}$$

$$\frac{60}{960} = \frac{1}{16} \text{ of } 100\% = 6\frac{1}{4}\% \text{ loss, Ans.}$$

8.  $37\frac{1}{2}\%$  or  $\frac{3}{8}$  of \$1200 = \$450.

$$\frac{450}{500} = \frac{9}{10} \text{ of } 100\% = 90\%, \text{ Ans.}$$

9.  $12\frac{1}{2}\% - 8\% = 4\frac{1}{2}\%$ ; \$0.18 =  $4\frac{1}{2}\%$  of the cost.

$$\frac{\$0.18}{4\frac{1}{2}} \times 100 = \$4, \text{ cost per yd., Ans.}$$

10. \$1 in currency = \$0.354 in gold.

$$\$1 \text{ in gold} = \$1 \div .354 = \$2.80 \text{ currency, Ans.}$$

### Article 441.

1.  $35\% + 45\% = 80\%$ ;  $100\% - 80\% = 20\%$ , what C owns.

$$35\% = \frac{7}{20}; \frac{7}{20} \text{ of } \$125000 = \$43750, \text{ A's share.}$$

$$45\% = \frac{9}{20}; \frac{9}{20} \text{ of } \$125000 = \$56250, \text{ B's "}$$

$$20\% = \frac{1}{5}; \frac{1}{5} \text{ of } \$125000 = \$25000, \text{ C's "}$$

2.  $\$5400 - \$4500 = \$900$ , gain.

$$\frac{900}{4500} = \frac{1}{5} \text{ of } 100\% = 20\%, \text{ gain, Ans.}$$

3.  $40\%$  or  $\frac{2}{5}$  of \$65000 = \$26000.

$$\$26000 = 125\% \text{ of cost of } 40\% \text{ of goods.}$$

$$\frac{\$26000}{125} \times 100 = \$20800, \text{ cost of } 40\% \text{ of goods.}$$

$$\$65000 - \$26000 = \$39000.$$

$$\$39000 = 130\% \text{ of cost of } 60\% \text{ of goods.}$$

$$\frac{\$39000}{130} \times 100 = \$30000, \text{ cost of } 60\% \text{ of goods.}$$

$$\$20800 + \$30000 = \$50800, \text{ Ans.}$$

4.  $100\% + 2\frac{1}{2}\% = 102\frac{1}{2}\%$ ;  $\$4500 = 102\frac{1}{2}\%$ .  
 $\frac{\$4500}{102\frac{1}{2}} \times 100 = \$4390.24\frac{1}{4}$ , sum expended.  
 $\$4500 - \$4390.24\frac{1}{4} = \$109.75\frac{1}{4}$ , commission.
5.  $15\%$  of  $\$5000 = \$750$ ;  $\$5000 - \$750 = \$4250$ .  
 $20\%$  of  $\$4250 = \$850$ ;  $\$4250 - \$850 = \$3400$ .  
 $\$750 + \$850 = \$1600$ , what he had drawn.  
 $12\frac{1}{2}\%$  or  $\frac{1}{8}$  of  $\$1600 = \$200$ .  
 $\$3400 + \$200 = \$3600$ , Ans.
6.  $\frac{9525}{15000} = \frac{127}{200} = .63\frac{1}{2}$ , or  $\$0.63\frac{1}{2}$ , Ans.
7.  $100\% - 25\% = 75\%$ ;  $\$80 = 75\%$  of cost.  
 $\frac{\$80}{75} \times 100 = \$106.66\frac{2}{3}$ , cost per acre.  
 $\$106.66\frac{2}{3} \times 1.40 = \$149.33\frac{1}{3}$ , Ans.
8.  $\$4500 \times .00\frac{7}{8} = \$33.75$ , Ans.
9.  $\$26.30 \times 6 = \$157.80$ , yearly payment.  
 $100\% - 35\% = 65\%$ .  
 $65\%$  of  $\$157.80 = \$102.57$ , Ans.
10.  $\$0.66 - \$0.55 = \$0.11$ , gain on 1 bushel of corn.  
 $\frac{11}{55} = \frac{1}{5}$  of  $100\% = 20\%$ , gain.  
 $\$1.37\frac{1}{2} - \$1.10 = \$0.27\frac{1}{2}$ , gain on 1 bushel of wheat.  
 $\frac{27\frac{1}{2}}{110} = \frac{55}{220} = \frac{1}{4}$  of  $100\% = 25\%$ , gain.  
 $25\% - 20\% = 5\%$ , greater profit on wheat, Ans.

**Article 442**

1. 1 mile = 5280 ft.; 45% or  $\frac{9}{20}$  of 5280 ft. = 2376 ft., Ans.

2. \$2800 - \$1600 = \$1200.

$$\frac{1200}{2800} = \frac{3}{7} \text{ of } 100\% = 42\frac{2}{7}\%, \text{ Ans.}$$

3. \$7500 = 37 $\frac{1}{2}$ %;  $\frac{\$7500}{37\frac{1}{2}} \times 100 = \$20000$ , Ans.

4. 75%, or  $\frac{3}{4}$ , of \$1600 = \$1200.

\$1200 = 62 $\frac{1}{2}$ % of B's money.

$$\frac{\$1200}{62\frac{1}{2}} \times 100 = \$1920, \text{ B's money.}$$

$$\$1600 + \$1920 = \$3520, \text{ Ans.}$$

5. \$16.25 = 20% of cost of coal.

$$\frac{\$16.25}{20} \times 100 = \$81.25, \text{ cost of coal.}$$

$$12500 \text{ lb.} \div 2000 = 6.25 \text{ tons.}$$

$$\$81.25 \div 6.25 = \$13, \text{ price per ton, Ans.}$$

6. 1880 had 366 days; December has 31 days.

$$\frac{31}{366} \text{ of } 100\% = 8\frac{2}{3}\%, \text{ Ans.}$$

7. 100% - 40% = 60%; 25% =  $\frac{1}{4}$ ;  $\frac{1}{4}$  of 60% = 15%.

\$4800 = 15% of his indebtedness.

$$\frac{\$4800}{15} \times 100 = \$32000, \text{ Ans.}$$



8.  $100\% - 77\% = 23\%$ ;  $2576 = 23\%$  of the population.

$$\frac{2576}{23} \times 100 = 11200, \text{ Ans.}$$

9.  $\$92.80 \div .05\frac{1}{2} = \$1740$ , value of the goods.

$$\$1740 + \$92.80 = \$1832.80, \text{ remittance.}$$

10.  $\$125000 \times .45 = \$56250$ , base.

$$\$56250 \times .04\frac{1}{2} = \$2531.25, \text{ premium.}$$

### Article 443.

1.  $115\% - 100\% = 15\%$ ;  $\$0.09 = 15\%$  of cost.

$$\frac{\$0.09}{15} \times 100 = \$0.60, \text{ Ans.}$$

2.  $\$900 \div .04\frac{1}{2} = \$20000$ , Ans.

3.  $1\%$  of  $\$5000 = \$50$ .

$$\$400 - \$50 = \$350, \text{ what he would receive for rent above expenses.}$$

$$\$5000 \times .06 = \$300.$$

$$\$350 - \$300 = \$50, \text{ annual gain by renting.}$$

Ans. By renting, by  $\$50$ .

4.  $100\% + 15\% = 115\%$ ;  $\$874 = 115\%$ .

$$\frac{\$874}{115} \times \frac{20}{100} = \$760, \text{ cost of goods, Ans.}$$

5.  $\$5895 - \$4585 = \$1310$ ;  $\frac{1}{2}$  of  $\$1310 = \$655$ , gain.

$$\$5895 - \$655 = \$5240, \text{ cost.}$$

$$\frac{655}{5240} = \frac{131}{1048} \text{ of } 100\% = 12\frac{1}{2}\%, \text{ Ans.}$$

6.  $\$2925 \div .04\frac{1}{2} = \$65000$ , whole value.

$$\frac{3}{8} \text{ of } \$65000 = \$24375, \text{ Ans.}$$

7.  $\$24.80 = 20\% \text{ of cost}$ ;  $\frac{\$24.80}{20} \times 100 = \$124$ , cost, Ans.

8.  $\$6.65 = 95\% \text{ of cost per bbl.}$

$$\frac{\$6.65}{95} \times 100 = \$7, \text{ cost per bbl.}$$

$$\$7 \times 1.05 = \$7.35, \text{ Ans.}$$

9.  $\$500 \times .07\frac{1}{2} = \$36$ , loss on the lot.

$$\$36 = 12\% \text{ of the cost of the horse.}$$

$$\frac{\$36}{12} \times 100 = \$300, \text{ cost of the horse.}$$

$$\$300 + \$36 = \$336, \text{ received for the horse, Ans.}$$

10.  $\$1537.90 = 112\frac{3}{4}\%$ ;  $\frac{\$1537.90}{112\frac{3}{4}} \times 100 = \$1365$ , cost.

$$\$1651.65 - \$1365 = \$286.65, \text{ gain.}$$

$$\frac{286.65}{1365.00} = \frac{1911}{9100} \text{ of } 100\% = 21\%, \text{ gain, Ans.}$$

### Article 444.

1.

2)  $\$125 = \text{Principal.}$

$$.6250 = 1 \text{ month's interest.}$$

$$39\frac{1}{10} = \text{Time in months.}$$

$$\underline{56250}$$

$$18750$$

$$625$$

$$\underline{\$24.4375} = \text{Interest at } 6\%.$$

$$4.0729 = \text{ " " } 1\%.$$

$$\underline{\$28.5104} = \text{ " " } 7\%.$$

$$125.$$

Ans.  $\underline{\$153.5104}$ , Amount.

2.  $\$1 \times .08 = \$0.08$ , interest of  $\$1$  for 1 year.

$$\$1 \div \$0.08 = 12\frac{1}{2} \text{ years, or } 12 \text{ y. } 6 \text{ mo., Ans.}$$

3.  $\$1 \times .07 \times 3.4 = \$0.238$ .

$$\$1 + \$0.238 = \$1.238, \text{ amount of } \$1 \text{ for } 3 \text{ y. } 4 \text{ mo. } 24 \text{ d.}$$

$$\$643.76 \div 1.238 = \$520, \text{ Ans.}$$

4. From Jan. 1, 1880, to July 4, 1882, = 2 y. 6 mo. 3 d.

2)  $\$475 = \text{Principal.}$

$$\underline{2.375} = 1 \text{ month's interest.}$$

$$\underline{30\frac{1}{10}} = \text{Time in months.}$$

$$\underline{71250}$$

$$2375$$

4)  $\$71.4875 = \text{Interest at } 6\%.$

$$17.8718 = \quad \quad \quad 1\frac{1}{2}\%.$$

$$\underline{\$89.3593} = \quad \quad \quad 7\frac{1}{2}\%.$$

5.  $\$450 \times .06 \times 1\frac{1}{3} = \$36$ , interest of  $\$450$ .

$$\$1 \times .06 \times 1\frac{1}{3} = \$0.08; \$1 + \$0.08 = \$1.08.$$

$$\$450 \div \$1.08 = \$416.66\frac{2}{3}, \text{ present worth of } \$450.$$

$$\$450 - \$416.66\frac{2}{3} = \$33.33\frac{1}{3}, \text{ discount of } \$4.50.$$

$$\$36 - \$33.33\frac{1}{3} = \$2.66\frac{2}{3}, \text{ Ans.}$$

6.  $\$450 - \$300 = \$150$ .

$$\$150 \times .06 = \$9, \text{ interest of } \$150 \text{ for 1 year.}$$

$$\$15.30 \div \$9 = 1\frac{7}{10}; 1\frac{7}{10} \text{ y.} = 1 \text{ y. } 8 \text{ mo. } 12 \text{ d., Ans.}$$

## 7.

Principal . . . . .	\$ 875.00
Int. from Jan. 1, 1879, to Mar. 10, 1880, 1 y. 2 m. 9 d.	62.56
Amount . . . . .	<u>\$ 937.56</u>
1st payment . . . . .	225.00
New principal . . . . .	<u>\$ 712.56</u>
Int. from Mar 10, 1880, to Apr. 1, 1881, 1 y. 22 d. .	45.37
Amount . . . . .	<u>\$ 757.93</u>
2d payment . . . . .	145.00
New principal . . . . .	<u>\$ 612.93</u>
Int. from Apr. 1, 1881, to Dec. 31, 1881, 9 mo. . .	27.58
Amount due Dec. 31, 1881 . . . . . Ans.	<u>\$ 640.51</u>

8. Interest of \$ 450 for 6 mo. 3 d. at  $7\frac{1}{2}\%$  = \$ 17.16.

$$\text{\$ } 450 - \text{\$ } 17.16 = \text{\$ } 432.84, \text{ proceeds, Ans.}$$

9. Bank discount of \$ 1 for 6 mo. 3 d. = \$ 0.0305.

$$\text{Proceeds of \$ } 1 = \$ 1 - \$ 0.0305 = \$ 0.9695.$$

$$\text{\$ } 800 \div \$ 0.9695 = \$ 825.17, \text{ face of note, Ans.}$$

10.  $\text{\$ } 0.15 \times .04 \times 15 = \$ 0.09$ , int. of \$ 0.15 for 15 y. at 4%.

$$\text{\$ } 15 \times .08 \times \frac{1}{24} = \$ 0.05, \text{ int. of \$ } 15 \text{ for 15 d. at } 8\%.$$

$$\text{\$ } 0.09 - \$ 0.05 = \$ 0.04, \text{ Ans.}$$

**Article 445.**

1.  $\text{\$ } 356.50 \times .08 \times 34\frac{1}{2} = \$ 108.93$ , interest of \$ 356.50.

$$\text{\$ } 480 \times .07 = \$ 33.60, \text{ interest of \$ } 480 \text{ for 1 y. at } 7\%$$

$$\text{\$ } 108.93 \div \$ 33.60 = 3 \text{ y. } 2 \text{ mo. } 27\frac{1}{2} \text{ d., Ans.}$$

2. Interest of \$ 1 for 3 mo. 24 d. at 7% = \$ 0.022 $\frac{1}{2}$ .

$$\text{\$ } 153.75 \div 0.022\frac{1}{2} = \$ 6936.09\frac{1}{2}, \text{ Ans.}$$

$$3. \$500 \times .01 \times 2\frac{1}{2} = \$12, \text{ interest of } \$500 \text{ at } 1\%.$$

$$\$84 \div \$12 = 7 = 7\%, \text{ Ans.}$$

$$4. \$1525 \times .04\frac{1}{2} = \$68.625, 1 \text{ year's interest.}$$

$$\frac{\$68.625 \times 214}{365} = \$40.23, \text{ Ans.}$$

5. Principal for 1st 6 mo. . . . .	\$1360.00
Interest " " . . . . .	54.40
Principal for 2d 6 mo. . . . .	<u>\$1414.40</u>
Interest " " . . . . .	56.58
Principal for 3d 6 mo. . . . .	<u>\$1470.98</u>
Interest " " . . . . .	58.84
Compound amount for 1 y. 6 mo. . . .	<u>\$1529.82</u>
Given principal . . . . .	1360.00
Compound interest for 1 y. 6 mo. . .	Ans. <u>\$169.82</u>

$$6. \text{ Amount of } \$1 \text{ for } 1 \text{ y. } 5 \text{ mo. } 18 \text{ d. at } 6\% = \$1.088.$$

$$\$1275 \div \$1.088 = \$1171.875, \text{ present worth.}$$

$$\$1275 - \$1171.875 = \$103.125, \text{ discount, Ans.}$$

7. A negotiable note is one payable to the bearer, or to the payee's order.

A note payable to order is made negotiable by the payee writing his name on the back.

8. A note is due on demand, if the time for payment is not specified.

Interest will accrue from either the date of the demand of payment, or from maturity, if the words "with interest" are omitted.

## 9.

Principal . . . . .	\$ 750.00
Int. from Jan. 15, 1878, to Sept. 20, 1879, 1 y. 8 m. 5 d.	75.63
Amount . . . . .	<u>\$ 825.63</u>
1st payment . . . . .	250.00
New principal . . . . .	<u>\$ 575.63</u>
Int. from Sept. 20, 1879, to June 12, 1880, 8 m. 23 d.	25.23
Amount . . . . .	<u>\$ 600.86</u>
2d payment . . . . .	120.00
New principal . . . . .	<u>\$ 480.86</u>
Int. from June 12, 1880, to May 25, 1881, 11 m. 13 d.	27.49
Amount due May 25, 1881 . . . . .	Ans. <u>\$ 508.35</u>

10. Bank discount-of \$ 1 for 9 mo. 18 d. at 7% = \$ 0.056.

Proceeds of \$ 1 = \$ 1 - \$ 0.056 = \$ 0.944.

\$ 1240 ÷ \$ 0.944 = \$ 1313.56—, Ans.

## Article 446.

1. \$ 700 × .07 × 2½ = \$ 122.50, simple interest.

Principal for 1st year . . . . .	\$ 700.00
Interest    "    " . . . . .	49.00
Principal for 2d year . . . . .	<u>\$ 749.00</u>
Interest    "    " . . . . .	52.43
Principal for 6 mo. . . . .	<u>\$ 801.43</u>
Interest    "    " . . . . .	28.05
Compound amount for 2 y. 6 mo. . . . .	<u>\$ 829.48</u>
Given principal . . . . .	\$ 700.00
Compound interest for 2 y. 6 mo. . . . .	<u>\$ 129.48</u>

\$ 129.48 - \$ 122.50 = \$ 6.98, Ans.

2. Interest of \$ 1 for 3 mo. 3d. at 7½% = \$ 0.019375.

\$ 700 × .019375 = \$ 13.56, bank discount, Ans.

3.  $\$1 \times .06 \times 1\frac{1}{4} = \$0.075.$

$\$27.47 \div .075 = \$366.26\frac{2}{3}, \text{ Ans.}$

4.  $\$648 \times .01 \times 2\frac{1}{2}\frac{2}{3} = \$14.886, \text{ int. at } 1\%.$

$\$81.873 \div \$14.886 = 5\frac{1}{2}; 5\frac{1}{2}\%, \text{ Ans.}$

5. Bank discount of  $\$1$  for 33 d. =  $\$0.0055.$

Proceeds of  $\$1 = \$1 - \$0.0055 = \$0.9945.$

$\$900 \div \$0.9945 = \$904.97+, \text{ face of note, Ans.}$

## 6.

Principal . . . . .	:	. . . . .	\$ 365.00
Int. from July 1, 1878, to Jan. 1, 1879, 6 mo. . . . .			10.95
Amount . . . . .			<u>\$ 375.95</u>
1st payment . . . . .			85.00
New principal . . . . .			<u>\$ 290.95</u>
Int. from Jan. 1, 1879, to July 1, 1879, 6 mo. . . . .			8.73
Amount . . . . .			<u>\$ 299.68</u>
2d payment . . . . .			125.00
New principal . . . . .			<u>\$ 174.68</u>
Int. from July 1, 1879, to Jan. 1, 1881, 1 y. 6 mo. . . . .			15.72
Amount due Jan. 1, 1881 . . . . .		Ans.	<u>\$ 190.40</u>

7. Principal for 1st year . . . . .	\$ 245.00
Interest " " . . . . .	11.03
Principal for 2d year . . . . .	<u>\$ 256.03</u>
Interest " " . . . . .	11.52
Principal for 6 mo. . . . .	<u>\$ 267.55</u>
Interest " " . . . . .	6.02
Compound amount . . . . .	<u>\$ 273.57</u>
Given principal . . . . .	245.00
Compound interest for 2 y. 6 mo. . . . .	Ans. <u>\$ 28.57</u>

8. Bank discount of \$1 for 5 mo. 3 d. at 8% = \$0.034.

Proceeds of \$1 = \$1 - \$0.034 = \$0.966.

\$217.35 ÷ 0.966 = \$225, face of note, Ans.

9. Interest of \$1 for 93 d. at 8% = \$0.0206 $\frac{2}{3}$ .

\$450 × .0206 $\frac{2}{3}$  = \$9.30, bank discount.

\$450 - \$9.30 = \$440.70, proceeds, Ans.

#### 10.

Amount of \$250 for 4 mo. 3 d. at 6% = \$255.13.

4 mo. 3 d. after May 16, 1880, = Sept. 19, 1880, day of maturity.

From July 5 to Sept. 19 = 76 d., term of discount.

Interest of \$255.13 for 76 d. at 7% = \$3.77, bank discount.

\$255.13 - \$3.77 = \$251.36, proceeds, Ans.

### Article 447.

1. From May 6, 1879, to July 7, 1881, = 2 y. 2 mo. 1 d.

2) \$105.23 = Principal.

.52615 = 1 month's interest.

26 $\frac{1}{3}$  = Time in months.

315690

105230

1753

Ans. \$13.69743, Interest.

2. \$300 × .06 = \$18.

\$47.25 ÷ \$18 = 2 $\frac{5}{6}$  y. = 2 y. 7 mo. 15 d., Ans.

3. \$560 × .01 × 2 $\frac{3}{4}$  = \$13.30, interest of \$560 at 1%.

\$106.40 ÷ \$13.30 = 8; 8%, Ans.

4. Bank discount of \$1 for 93 d. at 8% = \$0.0206 $\frac{2}{3}$ .

Proceeds of \$1 = \$1 - \$0.0206 $\frac{2}{3}$  = \$0.9793 $\frac{1}{3}$ .

\$293.80 ÷ \$0.9793 $\frac{1}{3}$  = \$300, face of note, Ans.



5.  $\$650 \times .06 \times 2\frac{3}{4} = \$104$ , simple interest.

Principal for 1st year . . . . .	\$ 650.00
Interest " " . . . . .	39.00
Principal for 2d year . . . . .	<u>\$ 689.00</u>
Interest " " . . . . .	41.34
Principal for 8 mo. . . . .	<u>\$ 730.34</u>
Interest " " . . . . .	29.21
Compound amount for 2 y. 8 mo. . . . .	<u>\$ 759.55</u>
Given principal . . . . .	650.00
Compound interest for 2 y. 8 mo. . . . .	<u>\$ 109.55</u>

$$\$109.55 - \$104 = \$5.55, \text{ Ans.}$$

6.  $\$1 \times .08 \times \frac{2}{5} = \$0.032$ , int. of \$1 for 4 mo. 24 d. at 8%.

$$\$78.08 \div .032 = \$2440, \text{ principal, Ans.}$$

7. From Jan. 6, 1880, to April 18, 1880, = 3 mo. 12 d.

$$\$500 \times .01 \times \frac{17}{60} = \$1.416\frac{2}{3}, \text{ interest of \$500 at 1\%}.$$

$$\$12.75 \div \$1.416\frac{2}{3} = 9; \text{ rate, 9 per cent.}$$

From Jan. 6, 1880, to Feb. 23, 1881, = 1 y. 1 mo. 17 d.

$$\begin{array}{rcl}
 2) \$500 & = & \text{Principal.} \\
 \underline{2.50} & = & 1 \text{ month's interest.} \\
 \underline{13\frac{1}{2}} & = & \text{Time in months.} \\
 750 & & \\
 250 & & \\
 \underline{1416\frac{2}{3}} & & \\
 \$33.916\frac{2}{3} & = & \text{Interest at 6\%.} \\
 \underline{16.958\frac{1}{3}} & = & \text{" " 3\%.} \\
 \$50.875 & = & \text{" " 9\%.} \\
 500 & & 
 \end{array}$$

$$\text{Ans. } \$550.875 = \text{Amount.}$$

## 8.

Principal . . . . .	\$ 320.00
Int. from July 14, 1874, to Dec. 24, 1874, 5 mo. 10 d.	11.38
Amount . . . . .	<u>\$ 331.38</u>
Payment . . . . .	180.00
New principal . . . . .	<u>\$ 151.38</u>
Int. from Dec. 24, 1874, to March 30, 1875, 3 mo. 6 d.	3.23
Amount due March 30, 1875 . . . . . Ans.	<u>\$ 154.61</u>

9. From July 6, 1881, to Nov. 18, 1881, = 135 d.  
 135 d. + 3 d. = 138 d., term of discount.  
 Int. of \$ 1728 for 138 d. at 6% = \$ 39.744, bank discount.  
 $\$ 1728 - \$ 39.744 = \$ 1688.256$ , proceeds, Ans.

10. Principal for 1st 6 mo. . . . .	\$ 860.00
Interest " " . . . . .	30.10
Principal for 2d 6 mo. . . . .	<u>\$ 890.10</u>
Interest " " . . . . .	31.15
Principal for 3d 6 mo. . . . .	<u>\$ 921.25</u>
Interest " " . . . . .	32.24
Compound amount for 18 mo. . . . . Ans.	<u>\$ 953.49</u>

## Article 448.

1.  $\$ 275 - \$ 175 = \$ 100$ , interest.  
 $\$ 175 \times .06 = \$ 10.50$ ;  $\$ 100 \div \$ 10.50 = 9\frac{1}{2}$ .  
 $9\frac{1}{2}$  y. = 9 y. 6 mo. 8 $\frac{1}{2}$  d., Ans.
2. From Jan. 10, 1881, to July 10, 1881, = 6 mo.  
 $\$ 500 \times .01 \times \frac{1}{2} = \$ 2.50$ .  
 $\$ 529.16\frac{2}{3} - \$ 500 = \$ 29.16\frac{2}{3}$ , interest.  
 $\$ 29.16\frac{2}{3} \div \$ 2.50 = 11\frac{2}{3}$  per cent, Ans.

3. From July 5, 1868, to June 1, 1870, = 1 y. 10 mo. 27 d.

2) \$1250 = Principal.

6.25 = 1 month's interest.

22 $\frac{2}{3}$  = Time in months.

1250

1250

5625

3) \$143.125 = Interest at 6%.

47.708 $\frac{1}{3}$  = " " 2%.

\$190.833 $\frac{1}{3}$  = " " 8%.

1250.

Ans. \$1440.833 $\frac{1}{3}$  = Amount.

4. Amount of \$1 for 60 d. at 6% = \$1.01.

\$450 ÷ \$1.01 = \$445.544, present worth.

\$450 - \$445.544 = \$4.456, discount.

Int. of \$450 for 63 d. at 6% = \$4.725, bank discount.

\$4.725 - \$4.456 = \$0.269, Ans.

5.

Principal . . . . .	\$425.00
Int. from Mar. 25, 1880, to June 1, 1881, 1 y. 2 mo. 7 d.	40.33
Amount . . . . .	<u>\$465.33</u>
1st payment . . . . .	75.00
New principal . . . . .	<u>\$390.33</u>
Int. from June 1, 1881, to Dec. 30, 1881, 6 mo. 29 d.	18.13
Amount . . . . .	<u>\$408.46</u>
2d payment . . . . .	120.00
New principal . . . . .	<u>\$288.46</u>
Int. from Dec. 30, 1881, to Sept. 1, 1882, 8 mo. 2 d.	15.51
Amount due Sept. 1, 1882 . . . . . Ans.	<u>\$303.97</u>

6. \$1 × .07 × 2 $\frac{1}{2}$  = \$0.175; \$1 + \$0.175 = \$1.175.

\$1410 ÷ \$1.175 = \$1200, present worth.

\$1410 - \$1200 = \$210, discount, Ans.

7. 3 mo. 3 d. after May 10 = Aug. 13, day of maturity.  
 From June 10 to Aug. 13 = 64 d., term of discount.  
 Int. of \$1 for 64 d. at 6% = \$0.010 $\frac{2}{3}$ , bank discount.  
 $\$1 - \$0.010\frac{2}{3} = \$0.989\frac{1}{3}$ , proceeds.  
 $\$395.80 \div .989\frac{1}{3} = \$400.06\frac{3}{4}$ , face of note, Ans.

## 8.

Principal . . . . .	\$ 2000.00
Int. fr. June 15, 1880, to Aug. 27, 1881, 1y. 2m. 12d.	192.00
Amount . . . . .	<u>\$ 2192.00</u>
Payment . . . . .	1450.00
Amount due Aug. 27, 1881 . . . . .	<u>\$ 742.00</u>

\$742.

Aug. 27, 1881.

For value received I promise to pay Henry Smith, or order, seven hundred forty-two dollars, on demand, with interest at 8 per cent.

GEORGE PAGE.

9.  $\$500000 \times .03\frac{1}{2} = \$17500$ , annual income.  
 $\$17500 \div 4 = \$4375$ , quarterly income.

10. The annual income of a share of 8% stock is \$8. If the cost is 160, the income is  $\frac{8}{160}$ , or 5%, of the cost. The annual income of a share of 4% stock is \$4. If the cost is 120, the income is  $\frac{4}{120}$ , or  $3\frac{1}{3}\%$ , of the cost.

$5\% - 3\frac{1}{3}\% = 1\frac{2}{3}\%$  on the investment, loss, Ans.

## Article 449.

## 1.

The annual income of a share of 6% stock is \$6.

If the cost is 120, the income is  $\frac{6}{120}$ , or  $\frac{1}{20}$ , or 5%, of the cost, Ans.

2.  $\$1800 \div .04\frac{1}{2} = \$40000$ , sum invested, Ans.

3. 10% of \$100 = \$10.

\$100 - \$10 = \$90, the cost of one share.

\$112 - \$90 = \$22, gain on one share.

$$\frac{22}{90} = \frac{11}{45}; \frac{11}{45} \text{ of } 100\% = 24\frac{2}{3}\%, \text{ gain, Ans.}$$

4. 100% - 33% = 67%.

67% of \$100 = \$67, cost of 1 share.

100% - 20% = 80%.

80% of \$100 = \$80, what 1 share was sold for.

\$80 - \$67 = \$13, gain on 1 share.

$$\frac{13}{67} \text{ of } 100\% = 19\frac{2}{3}\% \text{ gain, Ans.}$$

5. \$164\frac{1}{2} + \frac{1}{2} = \$164\frac{3}{4}, cost of 1 share.

\$25000 \div 164\frac{3}{4} = 151 \text{ shares. } \\$122\frac{3}{4} \text{ left, Ans.}

6. 300 \times 4 \text{ mo.} = 1200 \text{ mo.}

If he can have \$1 for 1200 mo., he can have \$800 as many months as 1200 \div 800, = 1\frac{1}{2} \text{ mo., Ans.}

- 7.
- $\frac{700}{300} \times 10 \text{ mo.} = 7000 \text{ mo.}$

 $\frac{200}{200}$  $\frac{200}{200} \times 6 \text{ mo.} = 1200 \text{ mo.}$  $\frac{200}{200} \quad ) 5800 \text{ "}$  $\underline{\hspace{1cm}} 29 \text{ mo.}$ 

29 mo. - 10 mo. = 19 mo., Ans.

8. £500 6 d. = £500.025.

\$4.86\frac{1}{2} \times 500.025 = \$2432.62\frac{1}{2}, \text{ Ans.}

9. March 11, 1880, + 4 mo. = July 11, 1880.

April 7 to July 11 = 95 d.; May 15 to July 11 = 57 d.

**June 20 to July 11 = 21 d.**

$$400 \times 95 \text{ d.} = 38000 \text{ d.}$$

$$270 \times 57 \text{ " } = 15390 \text{ "}$$

$$350 \times 21 \text{ "} = 7350 \text{ "}$$

1020                      60740 d.

$$\text{\$}1850 - \text{\$}1020 = \text{\$}830; \quad 60740 \text{ d.} \div 830 = 73 + \text{d.}$$

**July 11, 1880, + 73 d. = Sept. 22, 1880, Ans.**

10.  $\frac{2400}{600}$

$$800 \times 6 = 4800 \text{ mo.}$$

$$\overline{1000} \times 10 = 10000 \text{ “}$$

2400       $\overline{)14800}$  “

$$\overline{6\frac{1}{4}} \text{ mo.} = 6 \text{ mo. } 5 \text{ d.}$$

Aug. 1 + 6 mo. 5 d. = Feb. 6, 1882, Ans.

### Article 450.

1.  $\frac{1}{2}$  of  $\frac{5}{8} = \frac{5}{16}$ ;  $\frac{5}{16} \div 2\frac{3}{4} = \frac{5}{16} \times \frac{5}{12} = \frac{25}{192}$ , Ans.

2. £44 16 s. = £44.8; £5 12 s. = £5.6

$$44.8 : 5.6 = 72 \text{ yd.} : x$$

$$\frac{5.6 \times 72}{8} = 9 \text{ yd., Ans.}$$

$$3. \left. \begin{array}{r} 18 : 8 \\ 3\frac{3}{4} : 2\frac{1}{2} \\ 67\frac{1}{2} : 450 \end{array} \right\} = 4\frac{1}{2} \text{ ft.} : x$$

$$\frac{\frac{4}{8} \times \frac{2}{6} \times \frac{50}{2} \times \frac{5}{5} \times \frac{450}{450} \times \frac{9}{9}}{\frac{18}{9} \times 23 \times \frac{185}{27} \times \frac{7}{7} \times \frac{7}{7}} =$$

$$8\frac{1}{3} \text{ ft., Ans.}$$

$$4. 12 : 7 = 15\frac{1}{2} \text{ d.} : x \quad \frac{7 \times 31}{12 \times 2} = \frac{217}{24} = 9\frac{1}{2} \text{ days, Ans.}$$

$$5. \left. \begin{array}{l} 10 : 11 \\ 10 : 11 \end{array} \right\} = 6 \text{ oz.} : x \quad \frac{11 \times 11 \times 6}{10 \times 10} = 7\frac{1}{2} \text{ ounces, Ans.}$$

$$6. \left. \begin{array}{l} 9 : 5 \\ 2\frac{1}{2} : 3\frac{3}{4} \\ 8 : 7\frac{1}{2} \end{array} \right\} = 30 \text{ acres} : x \quad \frac{\overset{5}{5} \times \overset{15}{2} \times \overset{5}{30} \times 11 \times \overset{5}{15}}{\underset{8}{9} \times \underset{4}{5} \times 3 \times 2} = 22\frac{1}{2} \text{ acres, Ans.}$$

$$7. \left. \begin{array}{l} 75 : 50 \\ 14 : 1\frac{1}{2} \end{array} \right\} :: 4\frac{1}{2} \text{ mo.} : x \quad \frac{\overset{4}{50} \times \overset{8}{16} \times 3 \times 9}{\underset{8}{75} \times \underset{7}{14} \times 2 \times 2} = 5\frac{1}{2} \text{ mo., Ans.}$$

$$8. \left. \begin{array}{l} 32 : 48 \\ 60 : 80 \\ 6 : 8 \end{array} \right\} = 36 \text{ men} : x \quad \frac{12 \quad 4 \quad 2}{\underset{4}{48} \times \underset{8}{80} \times \underset{8}{3} \times \overset{12}{36}} = 96 \text{ men, Ans.}$$

$$9. \left. \begin{array}{l} 25 : 45 \\ 4 : 7\frac{1}{2} \\ 3 : 6 \\ 9 : 8 \\ 9\frac{1}{2} : 8\frac{1}{2} \end{array} \right\} = 19 \text{ men} : x$$

$$\frac{\overset{3}{45} \times \overset{8}{15} \times \overset{2}{6} \times \overset{2}{3} \times 17 \times 19 \times 2}{\underset{8}{25} \times 2 \times 4 \times 9 \times 2 \times 3 \times 19} = 102 \text{ men, Ans.}$$

$$10. \left. \begin{array}{l} 36 : 48 \\ 12 : 9 \\ 12 : 9 \end{array} \right\} = 8 \text{ men} : x \quad \frac{\overset{4}{48} \times \overset{3}{9} \times \overset{2}{9} \times \overset{2}{3}}{\underset{8}{36} \times \underset{8}{12} \times \underset{4}{12}} = 6 \text{ men, Ans.}$$

**Article 451.**

1.  $\frac{9}{9} - \frac{5}{9} = \frac{4}{9}$ , A's part of capital.

$\frac{4}{9}$  of \$4500 = \$2000, A's share of gain.

2. 3 cows for 2 mo. = 6 cows for 1 mo.

2 " " 4 " = 8 " "

2 $\frac{1}{2}$  " " 3 " = 8 " "

The entire stock =  $\overline{22}$  " "

$\frac{6}{22} = \frac{3}{11}$ ;  $\frac{3}{11}$  of \$55 = \$15, 1st man pays.

$\frac{8}{22} = \frac{4}{11}$ ;  $\frac{4}{11}$  of \$55 = \$20, 2d " "

$\frac{8}{22} = \frac{4}{11}$ ;  $\frac{4}{11}$  of \$55 = \$20, 3d " "

3. \$2000 for 4 mo. = \$8000 for 1 mo.

\$3000 " 8 " = 24000 "

Ames's entire stock =  $\overline{\$32000}$  "

Howe's \$2000 for 12 mo. = \$24000 for 1 mo.

\$32000 + \$24000 = \$56000, entire capital.

$\frac{32000}{56000} = \frac{4}{7}$ ;  $\frac{4}{7}$  of \$2800 = \$1600, Ames's gain.

$\frac{24000}{56000} = \frac{3}{7}$ ;  $\frac{3}{7}$  of \$2800 = \$1200, Howe's gain.



4.  $280 \times \$1.25 = \$350.$

$125 + 150 + 200 + 225 = 700$  sheep.

A's stock  $= \frac{125}{700} = \frac{5}{28}$ ;  $\frac{5}{28}$  of  $\$350 = \$62.50$ , A pays.

B's "  $= \frac{150}{700} = \frac{3}{14}$ ;  $\frac{3}{14}$  of  $\$350 = \$75.00$ , B "

C's "  $= \frac{200}{700} = \frac{2}{7}$ ;  $\frac{2}{7}$  of  $\$350 = \$100.00$ , C "

D's "  $= \frac{225}{700} = \frac{9}{28}$ ;  $\frac{9}{28}$  of  $\$350 = \$112.50$ , D "

5.  $\$800 + \$1000 = \$1800.$

$\$2250 - \$1800 = \$450$ , C's gain.

C has  $\frac{450}{2250} = \frac{1}{5}$  of whole gain; he must have  $\frac{1}{5}$  of whole capital.

$\$3000 = \frac{1}{5}$ ;  $\frac{5}{5} = 5 \times \$3000 = \$15000.$

A's gain  $= \frac{800}{2250} = \frac{16}{45}$ ;  $\frac{16}{45}$  of  $\$15000 = \$5333\frac{1}{3}$ , A's stock.

B's "  $= \frac{1000}{2250} = \frac{4}{9}$ ;  $\frac{4}{9}$  of  $\$15000 = \$6666\frac{2}{3}$ , B's stock.

6. A's  $\$1300$  for 12 mo.  $= \$15600$  for 1 mo.

B's  $\$1000$  " 10 "  $= 10000$  "

C's  $\$900$  " 5 "  $= 4500$  "

The entire stock  $= \$30100$  "

$\frac{15600}{30100} = \frac{156}{301}$ ;  $\frac{156}{301}$  of  $\$750 = \$388\frac{4}{301}$ , A's gain.

$\frac{10000}{30100} = \frac{100}{301}$ ;  $\frac{100}{301}$  of  $\$750 = \$249\frac{10}{301}$ , B's "

$\frac{4500}{30100} = \frac{45}{301}$ ;  $\frac{45}{301}$  of  $\$750 = \$112\frac{30}{301}$ , C's "

7.  $\$4000 = \frac{2}{5}$  of capital.

$$\frac{\$4000}{2} \times 5 = \$10000, \text{ whole capital.}$$

$$20\% \text{ of } \$10000 = \$2000.$$

$$\$2000 - \$500 = \$1500, \text{ net gain.}$$

$$\frac{3}{5} \text{ of } \$1500 = \$900, \text{ 1st man's share.}$$

$$\frac{2}{5} \text{ of } \$1500 = \$600, \text{ 2d " "}$$

a.  $\$6 + \$10 + \$14 = \$30$ ;  $\frac{7}{15}$  of  $\$37680 = \$17584$ .

$$\frac{6}{30} = \frac{1}{5}; \frac{1}{5} \text{ of } \$17584 = \$3516.80, \text{ A's gain.}$$

$$\frac{10}{30} = \frac{1}{3}; \frac{1}{3} \text{ of } \$17584 = \$5861.33\frac{1}{3}, \text{ B's gain.}$$

$$\frac{14}{30} = \frac{7}{15}; \frac{7}{15} \text{ of } \$17584 = \$8205.86\frac{2}{3}, \text{ C's gain.}$$

9.

A can do  $\frac{1}{6}$  in 1 day; B can do  $\frac{1}{8}$  in 1 day; C can do  $\frac{1}{10}$  in 1 day.

They can all do  $\frac{1}{6} + \frac{1}{8} + \frac{1}{10} = \frac{47}{120}$ , in 1 day. It will take as

many days to do the whole as  $\frac{120}{120} \div \frac{47}{120} = 2\frac{1}{2}$  days, Ans.

10.  $\$1800 + \$750 + \$1950 = \$4500$ .

$$\$205 + \$260 + \$1200 = \$1665.$$

$$\frac{1665}{4500} = \frac{37}{100} = 37\%, \text{ what he can pay.}$$

$$37\% \text{ of } \$1800 = \$666, \text{ A receives.}$$

$$37\% \text{ of } \$750 = \$277.50, \text{ B receives.}$$

$$37\% \text{ of } \$1950 = \$721.50, \text{ C receives.}$$

**Article 452.**

- 1.
- $92\frac{54}{44}$
- ( 962, Ans.

$$\begin{array}{r}
 81 \\
 186 \overline{) 1154} \\
 \underline{1116} \phantom{0} \\
 1922 \overline{) 3844} \\
 \underline{3844}
 \end{array}$$

2.  $\sqrt{.1369} + \sqrt{1296} = .37 + 36 = 36.37$ , Ans.

3.  $160^2 - 130^2 = 25600 - 16900 = 8700$

$\sqrt{8700} = 93.27$  ft., Ans.

4.  $216 \times 24 = 5184$  sq. rd. ;  $\sqrt{5184} = 72$  rd.

(216 + 24), or 240,  $\times 2 = 480$  rd. around the 1st field. $72 \times 4 = 288$  rd. around the 2d field. $\$312 \div 480 = \$0.65$ , cost of 1 rd.

$288 \times \$0.65 = \$187\frac{1}{2}$ , Ans.

5.  $0.008^3 = 0.000000512$  ;  $\sqrt[3]{0.008} = 0.2$

$0.2 - 0.000000512 = 0.199999488$ , Ans.

6.  $810$  sq. ft.  $\times 10 = 8100$  sq. ft., area of garden.

$\sqrt{8100} = 90$  ft. on 1 side.

$90$  ft.  $\times 4 = 360$  ft. around the garden.

$360$  ft.  $\div 16\frac{1}{2} = 21\frac{1}{2}$  rd., Ans.

- 7.
- $34'012'224$
- ( 324, Ans.

27	
2700	7012
180	
4	
<u>2884</u>	5768
307200	1244224
3840	
16	
<u>311056</u>	1244224

- 8.
- $800^2 + 600^2 = 640000 + 360000 = 1000000$
- .

 $\sqrt{1000000} = 1000$  m, length of diagonal.

1000 meters = 10 hektometers.

$$1\frac{1}{2} \text{ min.} \times 10 = 12 \text{ min., Ans.}$$

- 9.
- $12.5 \times 10 \times 5 = 625$
- cu. ft.

$$\sqrt[3]{625} = 8.549 + \text{ft., or } 8.55 \text{ ft. nearly, Ans.}$$

- 10.
- $80^2 + 60^2 = 6400 + 3600 = 10000$

 $\sqrt{10000} = 100$  ft., slant height.100 ft.  $\times$  60 ft. = 6000 sq. ft. on 1 side.6000 sq. ft.  $\times$  4 = 24000 sq. ft. of surface. $120^2 = 14400$  sq. ft., area of base.

$$14400 \times \frac{80}{3} = 384000 \text{ cu. ft., Ans.}$$

**Article 453.**

- 1.
- $45^2 : 60^2 = \$75 : x$

$$\text{Or, } 2025 : 3600 = \$75 : \$133\frac{1}{3}, \text{ Ans.}$$

- 2.
- $373\frac{3}{4}248$
- ( 72 in., Ans.

14700	30248
420	
4	
<u>15124</u>	<u>30248</u>

3. 116 ft. - 80 ft. = 36 ft., perpendicular of triangle.

$$160^2 + 36^2 = 25600 + 1296 = 26896$$

$$\sqrt{26896} = 164 \text{ ft., Ans.}$$

4. 1 acre = 160 sq. rd. ;
- $\sqrt{160} = 12.6491+$
- rd.

$$12.6491 \times 4 = 50.5964 \text{ rd. ; } 50.5964 - 4 = 46.5964 \text{ rd.}$$

$$46.5964 \times 1 = 46.5964 \text{ rd., Ans.}$$

5. 12 h.
- $\times 4 = 48 \text{ h.} = 2880 \text{ min.}$

$$2880 \div 15 = 192 \text{ miles, A walks in 4 days.}$$

$$2880 \div 12 = 240 \text{ miles, B " " "}$$

$$240^2 + 192^2 = 57600 + 36864 = 94464$$

$$\sqrt{94464} = 307.3+ \text{ miles, Ans.}$$

- 6.
- $\sqrt[3]{262144} = 64 \text{ in. ; } 64^2 = 4096 \text{ sq. in., area of 1 face.}$

$$4096 \times 6 = 24576 \text{ sq. in., entire surface.}$$

$$64^2 + 64^2 = 4096 + 4096 = 8192$$

$$\sqrt{8192} = 90.5+ \text{ in., diagonal of one face.}$$

$$64^2 + 90.5+^2 = 4096 + 8192 = 12288$$

$$\sqrt{12288} = 110.8+ \text{ in., length of diagonal, Ans.}$$

- 7.
- $4^3 : 12^3 = 1 : x$
- ; or
- $64 : 1728 = 1 : 27$
- , Ans.

8.  $20^2 - 12^2 = 400 - 144 = 256$ ;  $256 = 16$  ft.  
 $16$  ft.  $\times$   $2$  ft. =  $32$  sq. ft. covered when the board is raised.  
 $20 \times 2 = 40$  sq. ft. covered when the board is flat.  
 $40$  sq. ft. -  $32$  sq. ft. =  $8$  sq. ft., Ans.
9.  $35^2 - 15^2 = 1225 - 225 = 1000$   
 $\sqrt{1000} = 31.62+$  ft., half of width of house.  
 $31.62$  ft.  $\times$   $2 = 63.24$  ft., width of house, Ans.
10.  $100 \times 100 \times 1 = 10000$  cu. ft. in garden  $1$  ft. deep.  
 $100 \times 4 = 400$  ft. around the garden.  
 $400$  ft.  $\times$   $4$  ft. =  $1600$  sq. ft. in ditch, except corners.  
 $4^2 \times 4 = 64$  sq. ft. in corners.  
 $1600$  sq. ft. +  $64$  sq. ft. =  $1664$  sq. ft. in ditch.  
 $10000 \div 1664 = 6\frac{1}{16}$  ft., depth of ditch, Ans.

**Article 454**

$$\frac{\frac{3}{4} \text{ of } \frac{4}{5} \text{ of } 37\frac{1}{2}}{24\frac{1}{2} - 18\frac{3}{4}} = \frac{\frac{3}{4} \text{ of } \frac{4}{5} \text{ of } \frac{75}{2}}{\frac{98}{4} - \frac{75}{4}} = \frac{\frac{45}{2}}{\frac{23}{4}} = \frac{45}{2} \times \frac{4}{23} = \frac{90}{23} = 3\frac{6}{23}, \text{ Ans.}$$

$$2. \frac{3}{8} \text{ cwt.} = \frac{3}{8} \div 20 = \frac{3}{160} \text{ ton.}$$

$$\frac{\frac{3}{160}}{\frac{7}{8}} = \frac{3}{160} \times \frac{8}{7} = \frac{3}{140} = .0214\bar{2}, \text{ Ans.}$$

3.  $25\%$  of  $\$2000 = \$500$ , gain.  
 $\$2000 + \$500 = \$2500$ , what it was sold for.  
 $\$2500 = 87\frac{1}{2}\%$  of what he asked.  
 $\frac{\$2500}{87\frac{1}{2}} \times 100 = \$2857\frac{1}{2}$ , what he asked, Ans.

4. Principal . . . . .	\$ 400.00
Interest for 1 year . . . . .	28.00
Amount . . . . .	<u>\$ 428.00</u>
1st payment . . . . .	100.00
New principal . . . . .	<u>\$ 328.00</u>
Interest for 1 year . . . . .	22.96
Amount . . . . .	<u>\$ 350.96</u>
2d payment . . . . .	100.00
New principal . . . . .	<u>\$ 250.96</u>
Interest for 1 year . . . . .	17.57
Amount . . . . .	<u>\$ 268.53</u>
3d payment . . . . .	100.00
New principal . . . . .	<u>\$ 168.53</u>
Interest for 4 mo. . . . .	3.93
Amount due 3 y. 4 mo. from date . . . Ans.	<u>\$ 172.46</u>

5. Interest of \$1 for 93 d. at 7% = \$0.0180 $\frac{1}{2}$ .

$$\$1250 \times 0.0180\frac{1}{2} = \$22.60, \text{ bank discount.}$$

$$\$1250 - \$22.60 = \$1227.40, \text{ proceeds, Ans.}$$

6. Time to midnight =  $\frac{3}{4}$  of time to midnight; time past noon =  $\frac{3}{4}$  of time to midnight; the time from noon to midnight, 12 hours, is  $\frac{3}{4} + \frac{3}{4}$ , or  $\frac{6}{4}$ , of the time to midnight. 12 hours is  $\frac{4}{3}$  of  $7\frac{1}{2}$  hours. The time to midnight being  $7\frac{1}{2}$  hours, the time past noon is 12 hours —  $7\frac{1}{2}$  hours, or  $4\frac{1}{2}$  hours, or 4.48 P.M., Ans.

$$7. \frac{1}{4} \text{ acre} = 10890 \text{ sq. ft. ; } 9 \text{ in.} = \frac{3}{4} \text{ ft.}$$

$$10890 \times \frac{3}{4} \times \frac{1}{27} = 302\frac{1}{2} \text{ cu. yd.}$$

$$\$0.50 \times 302\frac{1}{2} = \$151.25, \text{ Ans.}$$

8.  $216 \times 24 = 5184$  sq. rd.;  $\sqrt{5184} = 72$  rd.  
 $(216 + 24), \text{ or } 240, \times 2 = 480$  rd. around the 1st field.  
 $72 \times 4 = 288$  rd. around the 2d field.

$$480 : 288 = \$312 : x \quad \frac{\overset{3}{288} \times 312}{\underset{5}{480}} = \$187.20, \text{ Ans.}$$

9.  $74'088$  (42, Ans.

$$\begin{array}{r|l} 64 & \\ \hline 4800 & 10088 \\ 240 & \\ 4 & \\ \hline 5044 & 10088 \end{array}$$

10.

$$\left. \begin{array}{l} 21 : 7 \\ 60 : 80 \\ 6 : 8 \\ 3 : 4 \end{array} \right\} = 12 : x \quad \frac{7 \times \overset{4}{80} \times \overset{4}{8} \times \overset{4}{4} \times \overset{4}{12}}{\underset{3}{21} \times \underset{3}{60} \times \underset{3}{6} \times \underset{3}{8}} = \frac{256}{27} = 9\frac{1}{3} \text{ d., Ans.}$$

### Article 455.

1.  $6 \text{ ft.} \times 3\frac{1}{2} \text{ ft.} = 19 \text{ sq. ft.}$   
 $27 \times 19 \text{ sq. ft.} = 513 \text{ sq. ft.} = 57 \text{ sq. yd.}$

$$57 \div \frac{3}{4} = 76 \text{ yd., Ans.}$$

2. Principal for 1st year . . . . .	\$ 200.00
Interest " " . . . . .	16.00
Principal for 2d year . . . . .	<u>\$ 216.00</u>
Interest " " . . . . .	17.28
Principal for 6 mo. 6 d. . . . .	<u>\$ 233.28</u>
Interest " " . . . . .	9.64
Compound amount for 2 y. 6 mo. 6 d.. Ans.	<u>\$ 242.92</u>



3. 102 A. 64 sq. rd. = 16384 sq. rd.

$$\sqrt{16384} = 128 \text{ rd., Ans.}$$

4.  $47\frac{3}{4} = \frac{24389}{512}$

$$\sqrt[3]{\frac{24389}{512}} = \frac{\sqrt[3]{24389}}{\sqrt[3]{512}} = \frac{29}{8} = 3\frac{5}{8} \text{ ft., Ans.}$$

5.  $600 \div .012 = 50000$ ;  $50000 \times .05 = 2500$

$$.005 \div 2500 = .000002, \text{ Ans.}$$

6.  $4\frac{2}{3} \div .03 = 142\frac{2}{3}$ ;  $142\frac{2}{3} : 6\frac{1}{2} = x : 8\frac{1}{2}$

$$\frac{2 \times 1000 \times 25}{13 \times 7 \times 3} = \frac{50000}{273} = 183\frac{41}{73}, \text{ Ans.}$$

7. 25% of \$420 = \$105, gain.

$$\$420 + \$105 = \$525, \text{ what it was sold for.}$$

$$63 \text{ gal.} - 10\frac{1}{2} \text{ gal.} = 52\frac{1}{2} \text{ gal.}$$

$$\$525 \div 52\frac{1}{2} = \$10, \text{ Ans.}$$

8. From Aug. 18, 1880, to Apr. 30, 1882, = 1 y. 8 mo. 12 d.

$$2) \$1200 = \text{Principal.}$$

$$\$6.00 = 1 \text{ month's interest.}$$

$$20\frac{2}{3} = \text{Time in months.}$$

$$\begin{array}{r} 12000 \\ 240 \end{array}$$

$$\begin{array}{r} 240 \\ \hline \end{array}$$

$$\$122.40 = \text{interest at 6\%}$$

$$30.60 = \text{ " " } 1\frac{1}{2}\%$$

$$\$91.80 = \text{ " " } 4\frac{1}{2}\%$$

9.  $\left. \begin{array}{l} 25 : 12 \\ 6 : 5 \\ 10 : 8 \end{array} \right\} = 200 : x$   $\frac{\overset{2}{12} \times \overset{8}{5} \times 8 \times \overset{8}{200}}{\underset{5}{25} \times 6 \times 10} = 64 \text{ rd., Ans.}$

10.  $7000 \times 15 \text{ d.} = 105000 \text{ d.}$  If he can have \$1 for 105000 d. he can have \$7500 as many days as  $105000 \div 7500 = 14 \text{ days, Ans.}$

**Article 456.**

1. The value of 7 in the number 78.342 is 70, and of 2 is 0.002.  $70 \div 0.002 = 35000$ . That is, the value of the 7 is 35000 times as great as that of the 2.

$$2. \quad 3\frac{1}{2} = \frac{10}{3} \times \frac{2}{15} = \frac{4}{9}; \quad \frac{4}{9} \text{ of } \frac{25}{2} = \frac{50}{9}$$

$$\frac{50}{9} - 4\frac{8}{9} = \frac{100}{18} - \frac{87}{18} = \frac{13}{18}, \text{ Ans.}$$

3.  $85\% \text{ of } .36 = .306$ ;  $.306 \text{ of the value of the ship} = \$22950$ .

$$\frac{\$22950}{.306} \times 1000 = \$75000, \text{ Ans.}$$

4.  $\$8000 - \$3200 = \$4800$ , net earnings.

$$\$4800 \div \$80000 = .06 = 6\%.$$

The annual income of a share of 6% stock is \$6. If the cost is \$120, the income is  $\frac{6}{120}$ , or  $\frac{1}{20}$ , or 5%, of the cost. Ans. 5%.

5.  $\$625 \times .08 \times 2\frac{1}{2} = \$125$ , simple interest.

Principal for 1st year . . . . .	\$ 625.00
Interest " " . . . . .	50.00
Principal for 2d year . . . . .	\$ 675.00
Interest " " . . . . .	54.00
Principal for 6 mo. . . . .	\$ 729.00
Interest " " . . . . .	29.16
Compound amount for 2 y. 6 mo. . . . .	\$ 758.16
Given principal . . . . .	625.00
Compound interest for 2 y. 6 mo. . . . .	\$ 133.16

$$\$133.16 - \$125 = \$8.16, \text{ Ans.}$$

6. 93 d. after Feb. 12, 1881, = May 16, 1881, date when due.

Int<sub>4</sub> of \$ 1250 for 93 d. at 6% = \$ 19.375, bank discount.

$$\$ 1250 - \$ 19.375 = \$ 1230.625, \text{ proceeds, Ans.}$$

$$7. \left. \begin{array}{l} 5 : 6 \\ 14 : 25 \\ 8 : 10 \end{array} \right\} = 2 : 5\frac{1}{4} \quad \frac{\overset{3}{6} \times 25 \times \overset{2}{10} \times \overset{2}{2}}{\underset{4}{5} \times 14 \times \underset{4}{8}} = \frac{75}{14} = 5\frac{5}{14} \text{ d., Ans.}$$

8. 

80 sq. rd.	80 sq. rd.
------------	------------

 1 A. = 160 sq. rd. ;  $\frac{1}{2}$  A. = 80 sq. rd.

$\sqrt{80}$  = width of rectangle.

$2 \times \sqrt{80}$  = length of rectangle.

$$(\sqrt{80})^2 + (2 \times \sqrt{80})^2 = 80 + (4 \times 80) = 400.$$

$$\sqrt{400} = 20 \text{ rd. in diagonal, Ans.}$$

9. 12 in.  $\times$  3.1416 = 37.6992 in., circumference of base.

$$37.6992 \times \frac{12}{2} = 226.1952$$

$$226.1952 \div 2 = 113.0976 \text{ sq. in., area of base.}$$

$$113.0976 \times \frac{12}{3} = 452.39 \text{ cu. in., Ans.}$$

10. 1 meter = 1 ten-millionth part of the distance on a meridian from the equator to the pole. Hence  $\frac{1}{4}$  of the circumference of the earth = 10000000 meters ; 4 times 10000000 meters = circumference of earth. The circumference divided by 3.1416 (Art. 222) will give the diameter.

**Article 457.**

- 1.
- $\$200 \times .08 \times 1\frac{1}{2} = \$27.47$
- , simple interest.

 $\$200 + \$27.47 = \$227.47$ , amount.Principal for 1 year. . . . .  $\$200.00$ Interest " " . . . . .  $16.00$ Principal for 8 mo. 18 d. . . . .  $\$216.00$ Interest " " " . . . . .  $12.38$ Compound amount for 1 y. 8 mo. 18 d. . .  $\$228.38$  $\$228.38 - \$227.47 = \$0.91$ , Ans.

2.  $\left. \begin{array}{l} 8 : 6 \\ 4 : 10 \\ 12 : 9 \end{array} \right\} = 18 : x \quad \frac{6 \times \overset{5}{10} \times 9 \times \overset{9}{18}}{\underset{4}{8} \times 4 \times \underset{2}{12}} = \frac{405}{16} = 25\frac{5}{16} \text{ A., Ans.}$

- 3.
- $\$15000 \div 1.25 = \$12000$
- .

Hence  $\$15000$  in currency =  $\$12000$  in gold. $\$12000 - \$10000 = \$2000$ , gain. $\frac{2000}{10000} = \frac{1}{5}$ ;  $\frac{1}{5}$  of 100% = 20%, gain, Ans.

4. 1 gross = 144 tacks.

 $\$0.00002 \times 144 = \$0.00288$ , cost of 1 gross. $\$12 \div \$0.00288 = 4166\frac{2}{3}$ , Ans.

- 5.
- $(14 \text{ rd.} + 12\frac{1}{2} \text{ rd.})$
- , or
- $26\frac{1}{2} \text{ rd.}$
- ,
- $\times 2 = 53 \text{ rd.}$

 $53 \text{ rd.} = 874.5 \text{ ft.}$ , length of fence. $874.5 \times 5\frac{1}{2} = 4809\frac{3}{4}$  board ft. $4809\frac{3}{4}$ , or  $4.809\frac{3}{4} \text{ M.} \times \$42 = \$202.0095$ , Ans.

6. 10% of
- $\$280 = \$28$
- ;
- $\$280 - \$28 = \$252$
- , cost.

 $\$4.50 \times 72 = \$324$ , what it was sold for.Interest of  $\$324$  for 93 d. at 6% =  $\$5.02$ , bank discount. $\$324 - \$5.02 = \$318.98$ , proceeds of note. $\$318.98 - \$252 = \$66.98$ , gain, Ans.

7.

$$\left(\frac{1}{2}\right)^3 : 7^3 = 1\frac{1}{2} : x, \text{ or } \frac{1}{8} : 343 = 1\frac{1}{2} : 4390\frac{1}{2} \text{ oz} = 274\frac{1}{2} \text{ lb., Ans.}$$

$$8. 27 \times 8 \times 125 = 27000 \text{ cu. ft.}$$

$$\sqrt[3]{27000} = 30 \text{ ft., length of 1 side.}$$

$$30 \text{ ft.}^2 = 900 \text{ sq. ft., area of 1 side, Ans.}$$

$$9. 16 \text{ cwt. } 40 \text{ lb.} = \frac{41}{50} \text{ T.; } \frac{41}{50} \times 20 = 16\frac{4}{5} \text{ T. in 20 loads.}$$

$$\$35 \times 16\frac{4}{5} = \$574, \text{ what was received for 20 loads.}$$

$$\$574 \times .08 = \$45.92, \text{ interest for 1 year.}$$

$$\$35 \times 20 = \$700, \text{ value of 20 T.}$$

$$\$700 - \$574 = \$126, \text{ interest.}$$

$$\$126 \div \$45.92 = 2 \text{ y. } 8 \text{ mo. } 28 \text{ d., Ans.}$$

$$10. \$4.50 \div \$0.50 = 9, \text{ number of pounds.}$$

$$18 \text{ ft.} \times 9 = 162 \text{ ft.} = \text{hypotenuse of triangle.}$$

$$162^2 - 56^2 = 26244 - 3136 = 23108.$$

$$\sqrt{23108} = 152 + \text{ft., height of the spire, Ans.}$$

**Article 458.**

$$1. \text{ Whole number of sheep} = 100\%.$$

$$\frac{4}{7} \text{ of } 100\% = 57\frac{1}{7}\% \text{ remaining; } 4\% + 57\frac{1}{7}\% = 61\frac{1}{7}\%.$$

$$100\% - 61\frac{1}{7}\% = 38\frac{6}{7}\%; \text{ 68 sheep} = 38\frac{6}{7}\%.$$

$$\frac{68}{38\frac{6}{7}} \times 100 = 175 \text{ sheep, Ans.}$$

$$2. 256 \times 4 \times 5 = 5120 \text{ cu. ft.; } 5120 \div 128 = 40 \text{ cords.}$$

$$\$152.56 \div 40 = \$3.81\frac{4}{5}, \text{ cost of 1 cord, Ans.}$$

$$3. 56 \times 85 = 4760 \text{ sq. ft.; } 14 \times \frac{1}{2} = 7 \text{ bd. ft. in 1 board.}$$

$$4760 \div 7 = 680 \text{ boards; } 680 \times 8 = 5440 \text{ nails.}$$

$$5440 \div 68 = 80 \text{ pounds, Ans.}$$

4.  $6^2 = 36$ ;  $8^2 = 64$ ;  $36 + 64 = 100$ .

$$\frac{36}{100} = \frac{9}{25}; \frac{9}{25} \text{ of } \$1000 = \$360, \text{ share of 1st.}$$

$$\frac{64}{100} = \frac{16}{25}; \frac{16}{25} \text{ of } \$1000 = \$640, \text{ share of 2d.}$$

5.  $1200 \times .08 \times 1\frac{1}{2} = \$165.07$ , simple interest.

Principal for 1st 6 mo. . . . . \$1200.00

Interest " " . . . . . 48.00

Principal for 2d 6 mo. . . . . \$1248.00

Interest " " . . . . . 49.92

Principal for 3d 6 mo. . . . . \$1297.92

Interest " " . . . . . 51.92

Principal for 2 mo. 19 d. . . . . \$1349.84

Interest " " . . . . . 23.69

Compound amount for 1 y. 8 mo. 19 d. . . \$1373.53

Given principal . . . . . 1200.00

Compound interest for 1 y. 8 mo. 19 d. . . \$173.53

$$\$173.53 - \$165.07 = \$8.46, \text{ Ans.}$$

6.  $2304^2 = 5308416 = \text{the number.}$

$$5'308'416 \text{ (174.4+}$$

1

$10^2 \times 3 =$	300	4308
$10 \times 7 \times 3 =$	210	
$7^2 =$	49	
	559	3913
$170^2 \times 3 =$	86700	395416
$170 \times 4 \times 3 =$	2040	
$4^2 =$	16	
	88756	355024
$1740^2 \times 3 =$	9082800	40392000
$1740 \times 4 \times 3 =$	20880	
$4^2 =$	16	
	9103696	36414784
	9103696	3977216

$$7. (1\frac{1}{2})^2 : (\frac{3}{4})^2 = 3 \text{ h.} : x, \text{ or } \frac{9}{4} : \frac{9}{16} = 3 \text{ h.} : x$$

$$\frac{4}{9} \times \frac{9}{16} \times 3 = \frac{3}{4} \text{ h., or 45 min., Ans.}$$

$$8. \$1 - \$0.02 = \$0.98, \text{ cost of } \$1 \text{ at sight.}$$

$$\$1 \times .0105 = \$0.0105, \text{ interest of } \$1 \text{ for 63 d. at 6\%.}$$

$$\$0.98 - \$0.0105 = \$0.9695, \text{ cost of } \$1 \text{ of exchange.}$$

$$\$1939 \div \$0.9695 = \$2000, \text{ face of the draft, Ans.}$$

$$9. \$508.50 \times .01 \times 2\frac{7}{8} = \$11.20\frac{2}{5}, \text{ int. of } \$508.50 \text{ at 1\%.}$$

$$\$89.609 \div \$11.20\frac{2}{5} = 8, \text{ or 8\%, Ans.}$$

$$10. 100\% + 4\frac{1}{2}\% = 104\frac{1}{2}\%; \quad \$7315 = 104\frac{1}{2}\%.$$

$$\frac{\$7315}{104\frac{1}{2}} \times 100 = \$7000, \text{ with which to buy apples.}$$

$$\$7315 - \$7000 = \$315, \text{ commission.}$$

$$\frac{315}{6300} = \frac{1}{20}; \quad \frac{1}{20} \text{ of } 100\% = 5\%, \text{ Ans.}$$

### Article 459.

$$1. \$10000 \div 1.05 = \$9523.80\frac{3}{11}, \text{ par value.}$$

$$\$9523.80\frac{3}{11} \times .05 = \$476.19\frac{1}{11}, \text{ yearly income, Ans.}$$

$$2. 1 \text{ section} = 640 \text{ acres; } 1 \text{ acre} = 0.4047^{\text{Ha}} = 4047^{\text{ca}}.$$

$$4047^{\text{ca}} \times 640 = 2590080^{\text{ca}}.$$

$$2590080 \times \$1.50 = \$3885120, \text{ Ans.}$$

$$3. 7912.5 \times 3.1416 = 24857.91 \text{ mi., circumference of earth.}$$

$$24857.91 \text{ mi.} \div 360 = 69.04\frac{3}{8} \text{ mi. in 1 degree.}$$

$$69.04\frac{3}{8} \text{ mi.} \div 60 = 1.15\frac{1}{2}\frac{9}{10} \text{ mi. in 1 minute, Ans.}$$

4. A fraction is reduced to larger terms without changing the value.  $\frac{2 \times 4 = 8}{3 \times 4 = 12}$ , the multiplication increasing the number of fractional units 4 times, and making each one  $\frac{1}{4}$  as large. Hence the value is not changed.

A fraction is reduced to smaller terms without changing the value.  $\frac{8 \div 4 = 2}{12 \div 4 = 3}$ , the division increasing the size of the fractional units 4 times, while their number is  $\frac{1}{4}$  as large, so that the value is not changed.

$$5. 18 \text{ ft.} \times 15 \text{ ft.} = 270 \text{ sq. ft.} = 30 \text{ sq. yd.}$$

$$27 \text{ in.} = \frac{27}{36} = \frac{3}{4} \text{ yd.}; \quad 30 \div \frac{3}{4} = 40 \text{ yd.}$$

$$\$2.50 \times 40 = \$100, \text{ Ans.}$$

$$6. 70 \text{ min.} = 1\frac{1}{2} \text{ h.}; \quad 15^\circ \text{ of longitude} = 1 \text{ h. in time.}$$

$$1\frac{1}{2} \times 15^\circ = 17.5^\circ \text{ west, Ans.}$$

$$120 \text{ min.} = 2 \text{ h.}; \quad 2 \times 15^\circ = 30^\circ \text{ of longitude east, Ans.}$$

$$7. 100\% + 16\frac{2}{3}\% = 116\frac{2}{3}\%; \quad \$3000 = 116\frac{2}{3}\%$$

$$\frac{\$3000}{116\frac{2}{3}} \times 100 = \$2571\frac{1}{3}, \text{ cost of 1st farm.}$$

$$100\% - 12\% = 88\%; \quad \$3000 = 88\%.$$

$$\frac{\$3000}{88} \times 100 = \$3409\frac{1}{11}, \text{ cost of 2d farm.}$$

$$\$3000 + \$3000 = \$6000, \text{ what both farms were sold for.}$$

$$\$2571\frac{1}{3} + \$3409\frac{1}{11} = \$5980\frac{4}{11}, \text{ what both farms cost.}$$

$$\$6000 - \$5980\frac{4}{11} = \$19\frac{7}{11}, \text{ gain, Ans.}$$

$$8. \$960 \times 2 = \$1920, \text{ annual income.}$$

$$\$1920 \div .04 = \$48000, \text{ par value of stock.}$$

$$\$48000 \times 1.20 = \$57600, \text{ amount to be invested, Ans.}$$



9.

$$40 \text{ rd. square} = 40 \times 40 = 1600 \text{ sq. rd.}$$

$$4 \text{ A.} = 4 \times 160 \text{ sq. rd.} = 640 \text{ sq. rd.}$$

$$20 \text{ rd. square} = 20 \times 20 \text{ sq. rd.} = 400 \text{ sq. rd.}$$

$$100 \text{ sq. rd.} + 640 \text{ sq. rd.} + 400 \text{ sq. rd.} = 1140 \text{ sq. rd., what was sold.}$$

$$1600 \text{ sq. rd.} - 1140 \text{ sq. rd.} = 460 \text{ sq. rd., Ans.}$$

$$10. \sqrt{21316} = 146; \sqrt[5]{150568768} = 532.$$

$$\frac{532}{146} \text{ of } 100\% = 364\frac{4}{13}\%, \text{ Ans.}$$

**Article 460.**

$$1. 1 \text{ section} = 1 \text{ sq. mi.}; \text{ perimeter of } 1 \text{ sq. mi.} = 4 \text{ mi.}$$

$$4 \times 5280 \times \$0.12\frac{1}{2} = \$2640, \text{ cost of fencing, Ans.}$$

$$2. 40 \times \frac{3}{4} = 30 \text{ sq. yd.} = 270 \text{ sq. ft.}$$

$$270 \text{ sq. ft.} \div 18 \text{ ft.} = 15 \text{ ft., width of room, Ans.}$$

3.

$$\frac{\frac{3}{4} \text{ of } \frac{5}{7} \text{ of } 12\frac{2}{3}}{18\frac{1}{2} - 12\frac{2}{3}} = \frac{\frac{3}{4} \text{ of } \frac{5}{7} \text{ of } \frac{112}{9}}{18\frac{2}{3} - 12\frac{1}{3}} = \frac{\frac{140}{21}}{\frac{101}{18}} = \frac{20}{21} \times \frac{6}{18} = \frac{120}{101} = 1\frac{19}{101}, \text{ Ans.}$$

$$4. 12 \text{ cd.} = 12 \times 128 \text{ cu. ft.} = 1536 \text{ cu. ft.}$$

$$9 \text{ ft.} \times 6 \text{ ft.} = 54 \text{ sq. ft.}$$

$$1536 \div 54 = 28\frac{2}{3} \text{ ft., length of the pile, Ans.}$$

5.  $45 \times 30 = 1350$  yd.;  $\$3.75 \times 1350 = \$5062.50$ , cost.

$$\$1 \times .06 \times \frac{3}{4} = \$0.045; \$1 + \$0.045 = \$1.045.$$

$$\$5062.50 \div 1.045 = \$4844.50, \text{ present worth of } \$5062.50.$$

$$\$4 \times 1350 = \$5400, \text{ what it was sold for.}$$

$$\$1 \times .06 \times \frac{1}{3} = \$0.02; \$1 + \$0.02 = \$1.02.$$

$$\$5400 \div 1.02 = \$5294.12, \text{ present worth of } \$5400.$$

$$\$5294.12 - \$4844.50 = \$449.62, \text{ gain, Ans.}$$

6. 4 mo. 3 d. after June 15 = Oct. 18, date when due.

From Aug. 18 to Oct. 18 = 61 d., term of discount.

Int. of  $\$4500$  for 61 d. at  $7\frac{1}{2}\%$  =  $\$57.18\frac{1}{2}$ , bank discount.

$$\$4500 - \$57.18\frac{1}{2} = \$4442.81\frac{1}{2}, \text{ proceeds, Ans.}$$

7.  $\$1 \times .04 \times 3\frac{3}{4} = \$0.15.$

$$\$1 + \$0.15 = \$1.15, \text{ amount of } \$1 \text{ for 3 y. 9 mo. at } 4\%.$$

$$\$520 \div 1.15 = \$452.17\frac{2}{3}, \text{ principal, Ans.}$$

$$\left. \begin{array}{l} 24 : 16 \\ 9 : 12 \\ 15 : 45 \\ 8 : 9 \\ 3 : 6 \end{array} \right\} = 6 : x \quad \frac{\overset{2}{16} \times \overset{4}{12} \times \overset{3}{45} \times 9 \times 6 \times 6}{\underset{3}{24} \times 9 \times \underset{2}{15} \times \underset{2}{8} \times 3} =$$

36 men, Ans.

9. 1 section of land = 1 sq. mi.; 1 sq. mi. is 320 rd. long.

$$320^2 + 320^2 = 102400 + 102400 = 204800.$$

$$\sqrt{204800} = 452.54 \text{ rd. diagonal.}$$

$$\frac{452.54}{2} = 226.27 \text{ rd. from the centre to each corner, Ans.}$$

10. 24 ft. 6 in. =  $24\frac{1}{2} = \frac{49}{2}$  ft.; 20 ft. 9 in. =  $20\frac{3}{4} = \frac{83}{4}$  ft.

$$8 \text{ in.} = \frac{2}{3} \text{ ft.}$$

$$\frac{49 \times 83 \times \frac{2}{3}}{2 \times 4 \times 3} = \frac{4067}{12} = 338\frac{11}{12} \text{ cu. ft., Ans.}$$

**Article 461.**

1. 93 d. = term of discount.

Bank discount of \$1 for 93 d. at 8% = \$0.0206 $\frac{2}{3}$ .Proceeds of \$1 = \$1 - \$0.0206 $\frac{2}{3}$  = \$0.9793 $\frac{1}{3}$ .\$850  $\div$  \$0.9793 $\frac{1}{3}$  = \$867.94, face of note, Ans.\$867. $\frac{24}{100}$ .

March 30, 1881.

Ninety days after date I promise to pay to the order of  
Wm. White, eight hundred sixty-seven  $\frac{24}{100}$  dollars. Value  
received.

JOHN SMITH.

2.

$$3\frac{1}{8} \div .31 = \frac{\frac{25}{8}}{\frac{31}{100}} = 12\frac{1}{8}; .31 \div 3\frac{1}{8} = \frac{\frac{31}{100}}{\frac{25}{8}} = \frac{2}{25};$$

$$12\frac{1}{8} - \frac{2}{25} = 12\frac{31}{80}, \text{ Ans.}$$

3.

100% + 25% = 125%; \$46 = 125% of the cost.

$$\frac{\$46}{125} \times 100 = \$36.80, \text{ cost per ton. } 100\% + 18\frac{1}{4}\% = 118\frac{1}{4}\%.$$

$$118\frac{1}{4}\% \text{ of } \$36.80 = \$43.516, \text{ Ans.}$$

4. 80 ft. square = 80
- $\times$
- 80 = 6400 sq. ft.

6400 sq. ft.  $\times$  12 = 76800 sq. ft. in 12 lots.76800 sq. ft. = 1 $\frac{377}{88}$  acres.

$$\$50 \times 1\frac{377}{88} = \$88.\frac{56}{88}, \text{ Ans.}$$

5. 348
- $\div$
- 2 = 174 leaves in one book.

32  $\times$  174 = 5568 leaves in thirty-two books.

1 sheet makes eight octavo leaves.

5568  $\div$  8 = 696 sheets required.

$$696 \div 480 = 1\frac{29}{80} \text{ reams, Ans.}$$

6.  $100\% + 2\frac{1}{3}\% = 102\frac{1}{3}\%$ ;  $\$720 = 102\frac{1}{3}\%$ .

$$\frac{\$720}{102\frac{1}{3}} \times 100 = \$702.43\overline{41}, \text{ amount expended.}$$

$$\$702.43\overline{41} \div \$0.37 = 1898\frac{144}{1817} \text{ lb., Ans.}$$

7.  $5 \div 3 = 1\frac{2}{3}$ .

B does  $1\frac{2}{3}$  times as much business as A, and hence has the opportunity to make 7% on his capital  $1\frac{2}{3}$  times while A is making 9% on his capital once.  $1\frac{2}{3} \times 7\% = 11\frac{2}{3}\%$ , B's gain. 9%, A's gain.  $11\frac{2}{3}\% - 9\% = 2\frac{2}{3}\%$  = gain of B more than A, or  $\$26\frac{2}{3}$  on  $\$1000$  capital.

8.  $48 \text{ ft.} \times 3.1416 = 150.7968 \text{ ft. of fence.}$

$$\frac{150.7968 \text{ ft.}}{4} = 37.6992 \text{ ft. on 1 side of square.}$$

$$37.6992^2 = 1421.2296 \text{ sq. ft., area of square field.}$$

9.  $\$325.50 \times .01 \times 3\frac{1}{2} = \$11.067$ , interest at 1%.

$$\$77.469 \div \$11.067 = 7, \text{ or } 7\%.$$

$$\$1.80 \times .01 \times 3\frac{1}{2} = \$0.0612, \text{ interest of } \$1.80 \text{ at } 1\%.$$

$$\$2.259 - \$1.80 = \$0.459.$$

$$\$0.459 \div \$0.0612 = 7\frac{1}{2}, \text{ or } 7\frac{1}{2}\%; 7\frac{1}{2}\% - 7\% = \frac{1}{2}\%.$$

Hence B receives  $\frac{1}{2}\%$  more, Ans.

10.  $\sqrt{.0064} = .08$ ;  $\sqrt[3]{.0064} = .185+$ .

$$.185+ - .08 = .105+, \text{ Ans.}$$

### Article 462

1.  $13\frac{3}{4} : 37\frac{1}{2} = \$11.75 : x$

$$\frac{3 \times 303 \times 11.75}{41 \times 8} = \$32.56\frac{197}{18}, \text{ Ans.}$$

2.  $80 \times 20 \times 2\frac{1}{4} = 3600 \text{ cu. ft.} = 6220800 \text{ cu. in.}$

$10 \times 9 \times 4 = 360 \text{ cu. in. in 1 stone.}$

$6220800 \div 360 = 17280 \text{ stones, Ans.}$

3.  $12\frac{1}{2} : 15 = \$4.20 : x$

$$\frac{2 \times \overset{3}{15} \times \overset{84}{4.20}}{\underset{\cancel{25}}{\cancel{25}}} = \$5.04, \text{ Ans.}$$

4.  $7\frac{3}{4}\% \text{ of } \$250 = \$19.06\frac{1}{4}.$

$\$250 + \$19.06\frac{1}{4} = \$269.06\frac{1}{4}, \text{ cost of 1 share.}$

$25 \times \$269.06\frac{1}{4} = \$6726.56\frac{1}{4}, \text{ Ans.}$

5. Interest of \$840 for 4 mo. 3 d. at 6% = \$17.22.

Hence the note should be sold for \$17.22 less than its face.

6.  $25^2 - 15^2 = 625 - 225 = 400.$

$\sqrt{400} = 20 \text{ yd., perpendicular of triangle.}$

$\frac{20 \text{ yd.} \times 15 \text{ yd.}}{2} = 150 \text{ sq. yd.} = 1350 \text{ sq. ft.}$

$\$0.08\frac{1}{3} \times 1350 = \$112.50, \text{ Ans.}$

7.

$35 \times 30 \times 12 = 12600 \text{ cu. ft.; } 40 \times 10 \text{ cu. ft.} = 400 \text{ cu. ft.}$

$12600 \div 400 = 31\frac{1}{2} \text{ minutes, Ans.}$

8.  $4832 \text{ lb.} + 4628 \text{ lb.} + 4976 \text{ lb.} = 14436 \text{ lb.}$

$1124 \text{ lb.} + 1136 \text{ lb.} + 1142 \text{ lb.} = 3402 \text{ lb.}$

$14436 \text{ lb.} - 3402 \text{ lb.} = 11034 \text{ lb., net weight.}$

$11034 \text{ lb.} = 5.517 \text{ T.}$

$\$33.37\frac{1}{2} \times 5.517 = \$184.129\frac{1}{2}, \text{ Ans.}$

9.  $\$1.20 \times 4000 = \$4800$ , value of the wheat.

$\frac{2}{3}$  of  $\$4800 = \$3200$ , value insured;  $\frac{3}{4}$  of  $1\frac{1}{2}\% = 1\frac{1}{8}\%$ .

$\$3200 \times .01\frac{1}{8} = \$36$ , premium.

$\$4800 - \$3200 = \$1600$ .

$\$1600 + \$36 = \$1636$ , Ans.

## 10.

Principal . . . . .	\$ 6000.00
Int. from Oct. 1, 1879, to Jan. 1, 1880, 3 mo. . . . .	120.00
Amount . . . . .	<u>\$ 6120.00</u>
1st payment . . . . .	500.00
New principal . . . . .	<u>\$ 5620.00</u>
Int. from Jan. 1, 1880, to Sept. 10, 1880, 8 mo. 9 d. . . . .	310.97
Amount . . . . .	<u>\$ 5930.97</u>
2d payment . . . . .	1126.00
New principal . . . . .	<u>\$ 4804.97</u>
Int. from Sept. 10, 1880, to Mar. 31, 1881, 6 mo. 21 d. . . . .	214.62
Amount . . . . .	<u>\$ 5019.59</u>
3d payment . . . . .	2000.00
New principal . . . . .	<u>\$ 3019.59</u>
Int. from Mar. 31, 1881, to Aug. 10, 1881, 4 m. 10 d. . . . .	87.23
Amount . . . . .	<u>\$ 3106.82</u>
4th payment . . . . .	876.50
New principal . . . . .	<u>\$ 2230.32</u>
Int. from Aug. 10, 1881, to Oct. 1, 1885, 4 y. 1 m. 21 d. . . . .	738.98
Amount due Oct. 1, 1885 . . . . .	Ans. <u>\$ 2969.30</u>

## Article 463.

1. 70 rd.  $5\frac{1}{2}$  ft. =  $1160\frac{1}{2}$  ft.; 52 rd.  $8\frac{1}{2}$  ft. =  $866\frac{1}{2}$  ft.

$1160\frac{1}{2}$  ft.  $\times$   $866\frac{1}{2}$  ft. =  $1005283\frac{1}{2}$  sq. ft.

$1005283\frac{1}{2}$  sq. ft. =  $23\frac{5}{8}$  acres.

$\$256 \times 23\frac{5}{8} = \$5908$ , Ans.

$$\begin{array}{rcl}
 2) \$725 & = & \text{Principal.} \\
 \underline{3.625} & = & \text{1 month's interest.} \\
 9\frac{2}{18} & = & \text{Time in months.} \\
 \underline{32625} & & \\
 483\frac{1}{3} & & \\
 \$33.108 & = & \text{Interest at 6\%.} \\
 5.518 & = & \text{" " 1\%.} \\
 \underline{\$27.590} & = & \text{" " 5\%.}
 \end{array}$$

$$\begin{array}{rcl}
 3. & 600 & \\
 600 \times 6 \text{ mo.} & = & 3600 \text{ mo.} \\
 600 \times 12 \text{ " } & = & 7200 \text{ " } \\
 600 \times 18 \text{ " } & = & 10800 \text{ " } \\
 600 \times 24 \text{ " } & = & 14400 \text{ " } \\
 600 \times 30 \text{ " } & = & 18000 \text{ " } \\
 600 \times 36 \text{ " } & = & 21600 \text{ " } \\
 \underline{4200} & & ) 75600 \text{ mo.} \\
 & & 18 \text{ mo., equated time, Ans.}
 \end{array}$$

4.

$$\begin{array}{l}
 5 \times 5 \times 50 = 1250 \text{ cu. ft., contents of chimney if solid.} \\
 1 \times 1 \times 50 \times 2 = 100 \text{ cu. ft., contents of the two flues.} \\
 1250 \text{ cu. ft.} - 100 \text{ cu. ft.} = 1150 \text{ cu. ft., contents of bricks used.} \\
 1728 \div (8 \times 4 \times 2) = 27 \text{ bricks in a cubic foot.}
 \end{array}$$

$$1150 \times 27 \text{ bricks} = 31050 \text{ bricks in chimney, Ans.}$$

$$5. \quad 100\% - 20\% = 80\%; \quad \$250 = 80\%.$$

$$\frac{\$250}{80} \times 100 = \$312.50, \text{ cost of the carriage, Ans.}$$

$$6. \quad 12^2 + 5^2 = 144 + 25 = 169.$$

$$\sqrt{169} = 13 \text{ ft., hypotenuse of triangle.}$$

$$13 \text{ ft.} = \text{diameter of the wheel.}$$

$$13 \text{ ft.} \times 3.1416 = 40.8408 \text{ ft., Ans.}$$

7. C's 9 sheep = 3 cows ; 3 cows + 4 cows = 7 cows.

D's 42 sheep = 14 cows.

A's 7 cows for 6 weeks = 42 cows for 1 week.

B's 3 cows for 13 weeks = 39 " " "

C's 7 cows for 7 weeks = 49 " " "

D's 14 cows for 5 weeks = 70 " " "

The entire number = 200 " " "

$\frac{42}{200}$  of \$ 75 = \$ 15.75, A's share.

$\frac{39}{200}$  of \$ 75 = \$ 14.62 $\frac{1}{2}$ , B's share.

$\frac{49}{200}$  of \$ 75 = \$ 18.37 $\frac{1}{2}$ , C's share.

$\frac{70}{200}$  of \$ 75 = \$ 26.25, D's share.

8. B has \$ 250 more than C.

A has \$ 250 + \$ 50 = \$ 300 more than C.

\$ 250 + \$ 300 = \$ 550 ; \$ 3000 - \$ 550 = \$ 2450.

$\frac{1}{3}$  of \$ 2450 = \$ 816 $\frac{2}{3}$ , C's share.

\$ 816 $\frac{2}{3}$  + \$ 250 = \$ 1066 $\frac{2}{3}$ , B's share.

\$ 816 $\frac{2}{3}$  + \$ 300 = \$ 1116 $\frac{2}{3}$ , A's share.

9.

$$80 : 1280 = 6^2 : x^2 \quad \frac{\overset{64}{1280} \times \overset{9}{36}}{\underset{20}{80}} = 576 ; \quad \sqrt{576} = 24 \text{ ft., Ans.}$$



10. A can do the work in  $\frac{1}{2}$  hour = 50 minutes. He can do  $\frac{1}{50}$  in 1 minute.

B can do  $\frac{1}{2}$  of the work in 1 hour, or 60 minutes. In one minute he can do  $\frac{1}{60}$  of  $\frac{1}{2}$  of the work, or  $\frac{1}{120}$ .

$$\frac{1}{50} + \frac{1}{120} = \frac{61}{1800}, \text{ A and B can do in 1 minute.}$$

To do  $\frac{1800}{61}$ , or the whole work, it will take

$$\frac{1800}{61} \div \frac{61}{1800} = 29\frac{1}{61} \text{ minutes, Ans.}$$

### Article 466.

1. 39.

7. XXIX.

2. 83.

8. LXXXIII.

3. 419.

9. XCVIII.

4. 11222.

10. CLXI.

5. 2544.

11. MDLXXX.

6. 1898.

12. MMDCCC.

13. MDCCLXXVI.

### Article 474.

16.

$$0.\dot{7}5\dot{3} = \frac{753}{999} = \frac{251}{333}, \text{ Ans.}$$

17.

$$0.\dot{5}9\dot{4} = \frac{594}{999} = \frac{22}{37}, \text{ Ans.}$$

$$18. 0.4\dot{2}\dot{5} = \frac{425}{1000} = \frac{421}{999} \times \frac{1}{10} = \frac{421}{9990}, \text{ Ans.}$$

$$19. 7.34\dot{5} = 7\frac{345}{1000} = 7\frac{311}{900} = \frac{6611}{900}, \text{ Ans.}$$

$$20. 0.\dot{1}3\dot{5} = \frac{135}{999} = \frac{5}{37}, \text{ Ans.}$$

$$21. \quad 53.00\dot{2}4\dot{3} = 53\frac{243}{100} = 53\frac{243}{100} = \frac{196109}{3700}, \text{ Ans.}$$

$$22. \quad 29.25\dot{9} = 29\frac{259}{100} = 29\frac{259}{100}; \quad 25.\dot{0}4\dot{7} = 25\frac{47}{100}.$$

$$29\frac{259}{100} - 25\frac{47}{100} = 4\frac{212}{100} = 4.212\dot{9}\dot{5}, \text{ Ans.}$$

$$23. \quad 5.9 = 5\frac{9}{10} = \frac{59}{10}; \quad 0.\dot{0}\dot{8} = \frac{8}{99}.$$

$$\frac{59}{10} \times \frac{8}{99} = \frac{472}{990} = \frac{236}{495} = .47\dot{6}, \text{ Ans.}$$

$$24. \quad 4.2\dot{7} = 4\frac{27}{10} = 4\frac{27}{10}; \quad 0.4\dot{2} = \frac{42}{99} = \frac{14}{33}.$$

$$\frac{27}{10} \div \frac{14}{33} = \frac{27}{10} \times \frac{33}{14} = \frac{121}{12} = 10.08\dot{3}, \text{ Ans.}$$

**Article 478.**

$$25. \quad 120 \text{ ch. } 75 \text{ li.} = 120.75 \text{ ch.}$$

$$120.75 \text{ ch.} \div 80 = 1.509375 \text{ miles, Ans.}$$

$$26. \quad 30 \text{ ch. } 25 \text{ li.} = 30.25 \text{ ch.}; \quad 25 \text{ ch. } 40 \text{ li.} = 25.40 \text{ ch.}$$

$$30.25 \times 25.40 = 768.35 \text{ sq. ch.}$$

$$768.35 \text{ sq. ch.} \div 10 = 76.835 \text{ acres, Ans.}$$

$$27. \quad 14 \text{ ch. } 50 \text{ li.} = 14.5 \text{ ch.}; \quad 24 \text{ ch. } 20 \text{ li.} = 24.2 \text{ ch.}$$

$$\frac{14.5 \times 24.2}{2} = 175.45 \text{ sq. ch.}$$

$$175.45 \text{ sq. ch.} \div 10 = 17.545 \text{ acres, Ans.}$$

28.  $500 \times 1.15 = 575$  miles, Ans.

29.  $1 \text{ lb } 8 \frac{3}{4} \text{ } 2 \text{ } 3 = 9720 \text{ gr.}; 9720 \div 20 = 486$ , Ans.

30.  $60 \times 8 = 480 \text{ m.}; 480 \text{ m.} \times 12 = 5760 \text{ m.}$ , Ans.

31.

$20000 \text{ lb.} \div 56 = 357 \frac{1}{7} \text{ bu.}; \$0.63 \times 357 \frac{1}{7} = \$225$ , Ans.

32.  $\$19.50 \times 4 = \$78$ , cost;  $200 \text{ lb.} \times 4 = 800 \text{ lb.}$

$\$0.14 \times 800 = \$112$ , what it was sold for.

$\$112 - \$78 = \$34$ , gain, Ans.

### Article 481.

33. 22, Ans.

34.

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

### Article 486.

36.

$$\begin{array}{r} 15 \overline{) 77^{\circ} \quad 2' \quad 48''} \\ \underline{\hspace{1.5cm}} 5 \text{ h. } 8 \text{ min. } 11 \frac{1}{2} \text{ sec., } \text{Ans.} \end{array}$$

$$\begin{array}{r}
 37. \quad \begin{array}{r} 2^{\circ} \quad 20' \quad 15'' \\ 71 \quad 4 \quad 9 \\ \hline 15 \times 73^{\circ} \quad 24' \quad 24'', \text{ difference of longitude.} \\ 4 \text{ h. } 53 \text{ min. } 37\frac{1}{2} \text{ sec., difference of time.} \\ 6 \\ \hline 10 \text{ h. } 53 \text{ min. } 37\frac{1}{2} \text{ sec., A. M., Ans.} \end{array}
 \end{array}$$

$$\begin{array}{r}
 38. \quad \begin{array}{r} 49 \text{ min. } 48\frac{1}{2} \text{ sec.} \\ 15 \\ \hline 12^{\circ} \quad 27' \quad 14'', \text{ Ans.} \end{array}
 \end{array}$$

$$\begin{array}{r}
 39. \quad \begin{array}{r} 53 \text{ min. } 30 \text{ sec.} \\ 15 \\ \hline 13^{\circ} \quad 22' \quad 30'', \text{ Ans.} \end{array}
 \end{array}$$

$$\begin{array}{r}
 40. \quad \begin{array}{r} 1 \text{ h. } 35 \text{ min. } 20 \text{ sec.} \\ 15 \\ \hline 23^{\circ} \quad 50' \quad 0'' \\ 69 \quad 50 \\ \hline 93^{\circ} \quad 40', \text{ west, Ans.} \end{array}
 \end{array}$$

### Article 493.

44. From Jan. 1, 1880, to Apr. 1, 1884, = 4 y. 3 mo.

Principal . . . . .	\$ 600.00		
1st annual interest . . . . .	\$ 36.00		
Int. on 1st annual int. 3 y. 3 mo. . .		\$ 7.02	
2d annual interest . . . . .	36.00		
Int. on 2d annual int. 2 y. 3 mo. . .		4.86	
3d annual interest . . . . .	36.00		
Int. on 3d annual int. 1 y. 3 mo. . .		2.70	
4th annual interest . . . . .	36.00		
Int. on 4th annual int. 3 mo. . . .		0.54	
5th annual interest . . . . .	9.00		
	<u>\$ 600.00</u>	<u>\$ 153.00</u>	<u>\$ 15.12</u>
Total interest, \$ 153 + \$ 15.12 . . .	168.12		
Amount due . . . . .	\$ 768.12,	Ans.	

## 45.

From May 16, 1881, to Mar. 16, 1884, = 2 y. 10 mo.

Principal . . . . .	\$ 1250.00		
1st annual interest . . . . .		\$ 62.50	
Int. on 1st annual int. 1 y. 10 mo. . . . .			\$ 5.73
2d annual interest . . . . .		62.50	
Int. on 2d annual int. 10 mo. . . . .			2.60
3d annual interest . . . . .		52.08	
	\$ 1250.00	\$ 177.08	\$ 8.33
Total interest, \$ 177.08 + \$ 8.33 . . . . .	185.41		
Amount due . . . . .	\$ 1435.41,	Ans.	

## 46.

From Mar. 14, 1880, to Sept. 25, 1883, = 3 y. 6 mo. 11 d.

Principal . . . . .	\$ 576.00		
1st annual interest . . . . .		\$ 34.56	
Int. on 1st annual int. 2 y. 6 mo. 11 d. . . . .			\$ 5.25
2d annual interest . . . . .		34.56	
Int. on 2d annual int. 1 y. 6 mo. 11 d. . . . .			3.17
3d annual interest . . . . .		34.56	
Int. on 3d annual int. 6 mo. 11 d. . . . .			1.10
4th annual interest . . . . .		18.34	
	\$ 576.00	\$ 122.02	\$ 9.52
Total interest, \$ 122.02 + \$ 9.52 . . . . .	131.54		
Amount due . . . . .	\$ 707.54,	Ans.	

**Article 494.****48.**

Principal drawing interest from April 1, 1873.....	\$2000.00	
1st annual int. due April 1, 1874	\$120.00	
Interest on same (2 years) .....		\$14.40
2d annual int. due April 1, 1875	120.00	
Interest on same (1 year).....		7.20
3d annual int. due April 1, 1876	120.00	
Amount due April 1, 1876 .....	<u>\$2000.00 + \$360.00 + \$21.60</u>	
1st payment Sept. 19, 1875.....	\$500.00	
Interest on same to April 1, 1876 (6 mo. 13 d.) .....	<u>16.08</u>	
Amount of pay't to April 1, 1876	<u>\$516.08 =</u>	<u>134.48 + 360.00 + 21.60</u>
Prin. drawing int. fr. Apr. 1, 1876	<u>\$1865.52</u>	
4th annual int. due April 1, 1877	\$111.93	
Interest on same (3 years) .....		\$20.15
5th annual int. due April 1, 1878	111.93	
Interest on same (2 years).....		12.43
6th annual int. due April 1, 1879	111.93	
Interest on same (1 year) .....		6.72
7th annual int. due April 1, 1880	111.93	
Amount due April 1, 1880.....	<u>\$1865.52 + \$447.72 + \$39.30</u>	
2d payment, Dec. 3, 1879 .....	600.00	
Interest on same to April 1, 1880 (3 mo. 29 d.).....	<u>11.90</u>	
	<u>\$611.90 =</u>	<u>124.88 + 447.72 + 39.30</u>
Prin. drawing int. fr. Apr. 1, 1880	<u>\$1740.64</u>	
8th annual int. due April 1, 1881	\$104.44	
Amount due April 1, 1881.....	<u>\$1740.64 + \$104.44</u>	
3d payment, Aug. 9, 1880 .....	775.00	
Interest on same to April 1, 1881	<u>30.10</u>	
	<u>\$805.10 =</u>	<u>700.66 + 104.44</u>
Principal on int. fr. Apr. 1, 1881	<u>\$1039.98</u>	
9th annual int. due April 1, 1882	\$62.40	
Interest on same (1 y. 1 m. 18 d.)		\$4.24
10th annual int. due Apr. 1, 1883	62.40	
Interest on same (1 m. 18 d.).....		0.50
Final int. on principal to May 19 (1 mo. 18 d.).....	<u>8.32</u>	
Amount due May 19, 1883.....	<u>\$1177.84 = \$1039.98 + \$133.12 + \$4.74</u>	

## 49.

Principal on int. fr. Jan. 13, 1874	\$5000.00		
1st annual int. due Jan. 13, 1875		\$300.00	
Int. on same to Jan. 13, '79 (4 y.)			\$72.00
2d annual int. due Jan. 13, 1876		300.00	
Int. on same to Jan. 13, '79 (3 y.)			54.00
3d annual int. due Jan. 13, 1877		300.00	
Int. on same to Jan. 13, '79 (2 y.)			36.00
4th annual int. due Jan. 13, 1878		300.00	
Int. on same to Jan. 13, '79 (1 y.)			18.00
5th annual int. due Jan. 13, 1879		300.00	
Amount due Jan. 13, 1879.....	<u>\$5000.00</u>	<u>+\$1500.00</u>	<u>+\$180.00</u>
1st payment, Sept. 23, 1878.....	\$2000.00		
Interest on same to Jan. 13, 1879 (3 mo. 21 d.).....	37.00		
Amount of payment Jan. 13, 1879	<u>\$2037.00</u>	<u>= 357.00 + 1500.00 + 180.00</u>	
<i>New prin.</i> on int. fr. Jan. 13, '79	<u>\$4643.00</u>		
6th annual int. due Jan. 13, 1880		\$278.58	
Interest on same to Jan. 13, 1881			\$16.71
7th annual int. due Jan. 13, 1881		278.58	
Amount due Jan. 13, 1881.....	<u>\$4643.00</u>	<u>+\$557.16</u>	<u>+\$16.71</u>
2d payment Feb. 19, 1880.....	1500.00		
Int. on same to Jan. 13, 1881 (10 mo. 25 d.).....	81.25		
<i>New prin.</i> on int. fr. Jan. 13, '81	<u>\$1581.25</u>	<u>= 1007.38 + 557.16 + 16.71</u>	
8th annual int. due Jan. 13, 1882		\$3665.62	
3d payment, May 29, 1881, there being nothing but annual int. due, draws no int. but goes to cancel annual int. due.....			<u>125.00</u>
Balance of 8th annual interest due Jan. 13, 1882.....		\$93.14	
Int. on same to Jan. 13, '84 (2 y.)			\$11.18
9th annual int. due Jan. 13, 1883		218.14	
Int. on same to Jan. 13, '84 (1 y.)			13.09
Amount due, Jan. 13, 1884.....		<u>\$3665.62</u>	<u>+\$529.42</u>
4th payment, June 11, 1883.....	20.00		<u>+\$24.27</u>
Interest on same to Jan. 13, '84 (7 mo. 2 d.).....	0.71		
	<u>\$20.71</u>		

Amount brought forward.....	\$3665.62 + \$529.42 + \$24.27	
Amount of 4th payment, which goes to cancel int. on annual int.		20.71
Bal. of simple int. due Jan. 13, '84		<u>\$3.56</u>
Unchanged principal.....	\$3665.62	
Accrued annual interest.....	\$529.42	
Interest on same to settlement (1 y. 7 mo. 17 d.).....		51.80
11th annual int. due Jan. 13, '85	218.14	
Interest on same to settlement (7 mo. 17 d.).....		8.25
Int. of principal from Jan. 13, '85, to settlement (7 mo. 17 d.).....		137.54
Amount due at settlement.....	<u>\$4584.33</u> = <u>\$3665.62</u> + <u>\$885.10</u> + <u>\$63.61</u>	

**Article 497.**

51.	Debits.		Credits.
July 10, 149 × 0 d. =	0 d.	July 15, 650 × 5 d. =	3250 d.
" 20, 601 × 10 d. =	6010 d.		
<u>\$ 750</u>	<u>6010 d.</u>	<u>\$ 650</u>	<u>3250 d.</u>
650			
<u>\$ 100, balance</u>	<u>3250 d.</u>		
	<u>2760 d.</u>		

$$2760 \div 100 = 27\frac{3}{4} = 28 \text{ days.}$$

July 10, 1881, + 28 d. = Aug. 7, 1881, average time, Ans.

52.	Debits.		Credits.
Oct. 30, 550 × 0 d. =	0 d.	Oct. 31, 400 × 1 d. =	400 d.
Nov. 14, 850 × 15 d. =	12750 d.	Nov. 4, 30 × 5 d. =	150 d.
<u>\$ 1400</u>	<u>12750 d.</u>	<u>\$ 430</u>	<u>550 d.</u>
430	550 d.		
<u>\$ 970, balance</u>	<u>12200 d.</u>		

$$12200 \div 970 = 12\frac{4}{7} = 13 \text{ days.}$$

Oct. 30, 1881, + 13 d. = Nov. 12, 1881, average time, Ans.



53.	<i>Debits.</i>	<i>Credits.</i>
Mar. 2,	$600 \times 0 \text{ d.} = 0 \text{ d.}$ $\$ 600$ 400 $\$ 200$ , balance.	Mar. 14, $400 \times 12 \text{ d.} = 4800 \text{ d.}$ $\$ 400$ 4800 d. 0 d. 4800 d.

$$4800 \div 200 = 24 \text{ days.}$$

Mar. 2 - 24 d. = Feb. 6, average time, Ans.

54.	<i>Debits.</i>	<i>Credits.</i>
1881.	Sept. 1, $150 \times 0 \text{ d.} = 0 \text{ d.}$ Dec. 10, $200 \times 100 \text{ d.} = 20000 \text{ d.}$	1881.
1882.	Feb. 28, $200 \times 180 \text{ d.} = 36000 \text{ d.}$ $\$ 550$ 300 $\$ 250$ , balance.	1882.
		Sept. 11, $60 \times 10 \text{ d.} = 600 \text{ d.}$ Dec. 10, $140 \times 100 \text{ d.} = 14000 \text{ d.}$ Jan. 29, $100 \times 150 \text{ d.} = 15000 \text{ d.}$ $\$ 300$ 29600 d.

$$26400 \text{ d.} \div 250 = 105\frac{3}{4} = 106 \text{ days.}$$

Sept. 1, 1881, + 106 d. = Dec. 16, 1881, average time, Ans.

### Article 505

56.  $\$ 2545 \times \$ 0.012 = \$ 30.54$ , B's tax on property.

$\$ 30.54 + \$ 1.75 = \$ 32.29$ , B's entire tax.

57.  $\$ 9565 \times \$ 0.012 = \$ 114.78$ , C's tax on property.

$\$ 114.78 + \$ 1.50 = \$ 116.28$ , C's entire tax.

$\$ 1764 \times \$ 0.012 = \$ 21.168$ , D's tax on property.

$\$ 21.168 + \$ 1.50 = \$ 22.668$ , D's entire tax.

$\$ 5630 \times \$ 0.012 = \$ 67.56$ , E's tax on property.

$\$ 67.56 + \$ 1.50 = \$ 69.06$ , E's entire tax.

## 58.

$$\$1 \times 600 = \$600.$$

$$\$600 + \$348 = \$948, \text{ sum to be assessed on the polls.}$$

$$\$948 \div 600 = \$1.58, \text{ to be assessed on each poll.}$$

$$\$348 + \$1500 + \$12100 = \$13948, \text{ entire tax.}$$

$$\$13948 - \$948 = \$13000, \text{ to be assessed on the property.}$$

$$\$1500 - \$600 = \$900, \text{ of the county tax to be assessed on the property.}$$

$$\$900 \div \$1000000 = 0.0009, \text{ rate of taxation for county tax.}$$

$$\$12100 \div \$1000000 = 0.0121, \text{ rate of taxation for town tax.}$$

$$\$5000 \times 0.0009 = \$4.50, \text{ A's county tax on property.}$$

$$\$4.50 + \$1 = \$5.50, \text{ A's entire county tax.}$$

$$\$5000 \times 0.0121 = \$60.50, \text{ A's town tax.}$$

$$\$5.50 + \$60.50 + \$0.58 = \$66.58, \text{ A's entire tax.}$$

## Article 510.

$$59. \text{ £ } 725 \text{ 3 s. 4 d.} = \text{£ } 725\frac{1}{2}.$$

$$\$4.866\frac{1}{2} \times 725\frac{1}{2} = \$3529.02\frac{43}{120}.$$

$$\$7 \times 200 = \$1400, \text{ duty.}$$

$$\$3529.02\frac{43}{120} + \$1400 = \$4929.02\frac{43}{120}, \text{ Ans.}$$

$$60. 2664.5 \times 6 = 15987 \text{ francs.}$$

$$\$0.193 \times 15987 = \$3085.491.$$

$$\$3085.491 \times .60 = \$1851.2946, \text{ Ans.}$$

$$61. 36 \text{ lb.} \times 7880 = 283680 \text{ lb.}$$

$$283680 \text{ lb.} \div 2240 = 126\frac{9}{14} \text{ T.}$$

$$\$20 \times 126\frac{9}{14} = \$2532\frac{9}{7}, \text{ Ans.}$$

$$62. \$0.932 \times 11102.7 = \$10347.7164.$$

$$\$10347.7164 \times .25 = \$2586.9291, \text{ ad valorem duty.}$$

$$\$0.05 \times 50381 = \$2519.05, \text{ specific duty.}$$

$$\$2586.9291 + \$2519.05 = \$5105.9791, \text{ Ans.}$$

63.  $640.4 \times 2.05 = 1312.82$  marks.  
 $100\% - 8\% = 92\%$ ;  $1312.82 \times .92 = 1207.7944$ .  
 $\$0.238 \times 1207.7944 = \$287.455$ .  
 $\$287.455 \times .40 = \$114.982+$ , ad valorem duty.  
1 meter = 39.37 inches.  
 $39.37 \text{ in.} \times 640.4 = 25212.548 \text{ in.} = \text{length}$ .  
 $25212.548 \times 43\frac{1}{2} = 1096745.838 \text{ sq. in.}$   
1 sq. yd. = 1296 sq. in.  
 $1096745.838 \div 1296 = 846.254 \text{ sq. yd.}$   
 $\$0.08 \times 846.254 = \$67.70+$ , specific duty.  
 $\$114.982 + \$67.70 = \$182.682+$ , Ans.

### Article 514

64.  $\frac{1}{4}$  of 42 in. = 10.5 in.;  $10.5^2 = 110.25$ .  
 $30 \times 110.25 = 3307.5$ .  
 $3307.5 \div 144 = 22\frac{3}{4} = 22.96+$  cu. ft., Ans.
65.  $\frac{1}{4}$  of 60 in. = 15 in.;  $15^2 = 225$ .  
 $24 \times 225 = 5400$ .  
 $5400 \div 144 = 37\frac{1}{2}$  cu. ft., Ans.

### Article 515.

66.  $21 \text{ in.} \times 0.707 = 14.847 \text{ in.}$ , Ans.
67.  $24 \text{ in.} \times 0.707 = 16.968 \text{ in.} = 1.414 \text{ ft.}$   
 $18 \text{ ft.} \times 1.414 \text{ ft.} \times 16.968 \text{ in.} = 431.869536 \text{ bd. ft.}$ , Ans.
68.  $6 \text{ ft.} = 72 \text{ in.}$ ;  $72 \text{ in.} \div 3.1416 = 22.918 \text{ in.} = \text{diameter}$ .  
 $22.918+ \times 0.707 = 16.20+$  in. = side.  
 $16.20 \div 12 = 1.35 \text{ ft.}$   
 $20 \text{ ft.} \times 1.35 \text{ ft.} \times 16.20 \text{ in.} = 437.4 \text{ bd. ft.}$   
 $437.4 \text{ bd. ft.} = 0.4374 \text{ thousand ft.}$   
 $\$30 \times 0.4374 = \$13.122$ , Ans.

**Article 518.**

69.  $22^2 = 484$ ;  $484 \times 30 = 14520$ .

$$14520 \times 0.0034 = 49.36\frac{1}{2} \text{ gal., Ans.}$$

70.  $30^2 = 900$ ;  $900 \times 38 = 34200$ .

$$34200 \times 0.0034 = 116.28 \text{ gal., Ans.}$$

71.  $30 \text{ in.} - 24 \text{ in.} = 6 \text{ in.}$ ;  $6 \times 0.7 = 4.2 \text{ in.}$

$$24 + 4.2 = 28.2, \text{ mean diameter.}$$

$$28.2^2, \text{ or } 795.24, \times 36 = 28628.64.$$

$$28628.64 \times 0.0129 = 369.309456 \text{ liters, Ans.}$$

72.  $4 \text{ ft. } 3 \text{ in.} = 4.25 \text{ ft.}$ ;  $3 \text{ ft. } 6 \text{ in.} = 3.5 \text{ ft.}$

$$4.25 \times 3.5 \times 4 = 59.5 \text{ cu. ft.}$$

$$1 \text{ cu. ft.} = 7\frac{1}{2} \text{ gal.}$$

$$59.5 \times 7\frac{1}{2} = 446.25 \text{ gal., Ans.}$$

**Article 520.**

73.  $\frac{3}{5}$  of  $20\frac{4}{5} \text{ ft.} = 12 \text{ ft.}$ ;  $75 \text{ ft.} - 12 \text{ ft.} = 63 \text{ ft.}$

$$63 \times 20 \times 9 = 11340.$$

$$11340 \div 95 = 119\frac{7}{19} \text{ tons, Ans.}$$

74.  $\frac{3}{5}$  of  $30\frac{6}{5} \text{ ft.} = 18 \text{ ft.}$ ;  $160 \text{ ft.} - 18 \text{ ft.} = 142 \text{ ft.}$

$$142 \times 30 \times 15 = 63900.$$

$$63900 \div 95 = 672\frac{1}{5} \text{ tons, Ans.}$$

**Article 526.**

75.  $8 \text{ ft.} \times 4 \text{ ft.} \times 3 \text{ ft.} = 96 \text{ cu. ft.}$

$$96 \text{ cu. ft.} \div 1\frac{1}{4} = 76\frac{2}{3} \text{ bu., Ans.}$$

76.  $8 \times 3\frac{1}{2} \times 2 = 56$  cu. ft.

$56 \div 1\frac{1}{4} = 44\frac{2}{3}$  bu. corn in the ear.

$44\frac{2}{3} \div 2 = 22\frac{2}{3}$  bu. shelled corn, Ans.

77.  $1200 \text{ lb.} \div 100 \text{ lb.} = 12$ .

$3 \text{ lb.} \times 12 = 36 \text{ lb.}$  per day each.

$36 \times 3 \times 120 = 12960 \text{ lb.}$

$\frac{2}{3}$  of  $12960 \text{ lb.} = 8640 \text{ lb.}$ , Ans.

78.  $1 \text{ bbl. flour} = 196 \text{ lb.}$

Since  $33 \text{ lb. less } \frac{1}{6} = 1 \text{ bu. wheat,}$

$196 \div 33 = 5\frac{8}{33}$  bu., Ans.

79.  $56 \text{ lb. corn} = 100 \text{ lb. meadow hay.}$

$1 \text{ ton} = 2000 \text{ lb.}; 2000 \text{ lb.} \div 100 \text{ lb.} = 20$ .

$100 \text{ lb. hay cost } \$0.75$ .

$\$0.75 \times 20 = \$15$ , cost per ton, Ans.

80.  $\frac{3}{5}$  of  $\overset{310}{\cancel{1550}} \text{ lb.} = 930 \text{ lb.}$ , net weight.

$\frac{1}{5}$  of  $930 \text{ lb.} = 186 \text{ lb.}$ , rump and sirloin.

$186 \text{ lb. round, Ans.}$

81.  $\frac{4}{5}$  of  $\overset{450}{\cancel{2250}} \text{ lb.} = 1800 \text{ lb.}$ , net weight.

$\frac{1}{4}$  of  $1800 \text{ lb.} = 450 \text{ lb.}$ , hams and shoulders.

$\frac{1}{3}$  of  $1800 \text{ lb.} = 600 \text{ lb.}$ , clear pork, Ans.

**Article 532.**

82.  $900 \text{ sq. ft.} \div 9 = 100 \text{ sq. yd.}$   
 $100 \div 35 = 2\frac{2}{7} \text{ casks lime.}$   
 $\$0.90 \times 2\frac{2}{7} = \$2.57\frac{1}{7}, \text{ cost of lime.}$   
 $10 \times 2\frac{2}{7} = 28\frac{2}{7} \text{ bu. of sand.}$   
 $\$0.08 \times 28\frac{2}{7} = \$2.28\frac{2}{7}, \text{ cost of sand.}$   
 $5 \times 2\frac{2}{7} = 14\frac{2}{7} \text{ lb. of hair.}$   
 $\$0.06 \times 14\frac{2}{7} = \$0.85\frac{2}{7}, \text{ cost of hair.}$   
 $\$2.57\frac{1}{7} + \$2.28\frac{2}{7} + \$0.85\frac{2}{7} = \$5.71\frac{3}{7}, \text{ Ans.}$
83.  $224 \times 4 = 896 \text{ sq. ft.}; 896 \text{ sq. ft.} \div 9 = 99\frac{5}{9} \text{ sq. yd.}$   
 $99\frac{5}{9} \times 40 = 3982\frac{2}{3} \text{ bricks.}$   
 $3982\frac{2}{3} \div 1000 = 3.982\frac{2}{3} \text{ thousand bricks.}$   
 $\$7.50 \times 3.982\frac{2}{3} = \$29.86\frac{2}{3}, \text{ cost of bricks.}$   
 $99\frac{5}{9} \div 20 = 4\frac{4}{9} \text{ days' work.}$   
 $\$2.75 \times 4\frac{4}{9} = \$13.68\frac{2}{3}, \text{ mason's bill.}$   
 $\$1.50 \times 4\frac{4}{9} = \$7.46\frac{2}{3}, \text{ helper's bill.}$   
 $\$29.86\frac{2}{3} + \$13.68\frac{2}{3} + \$7.46\frac{2}{3} = \$51.02\frac{2}{3}, \text{ Ans.}$
84.  $40 \times 24 = 960 \text{ sq. ft.} = 106\frac{2}{3} \text{ sq. yd.}$   
 $1 \text{ cask will concrete } 9 \text{ sq. yd.}$   
 $106\frac{2}{3} \div 9 = 11\frac{2}{3} \text{ casks of cement.}$   
 $\$2 \times 11\frac{2}{3} = \$23.70\frac{1}{3}, \text{ cost of cement.}$   
 $12 \text{ bu.} \times 11\frac{2}{3} = 142\frac{2}{3} \text{ bu. of gravel.}$   
 $\$0.08 \times 142\frac{2}{3} = \$11.37\frac{2}{3}, \text{ cost of gravel.}$   
 $\$23.70\frac{1}{3} + \$11.37\frac{2}{3} = \$35.08\frac{1}{3}, \text{ Ans.}$

85.  $100 \times 6 = 600$  sq. ft.

$12 \times 2 = 24$  bricks per sq. ft. (Art. 529.)

$24 \times 600 = 14400$  bricks = 14.4 thousand.

$\$8 \times 14.4 = \$115.20$ , cost of bricks.

$14400 \div 1000 = 14.4$  casks of lime. (Art. 530.)

$\$1.10 \times 14.4 = \$15.84$ , cost of lime.

$10 \times 14.4 = 144$  bu. of sand.

$\$0.10 \times 144 = \$14.40$ , cost of sand.

$14400 \div 2000 = 7.2$  days' work.

$\$3 \times 7.2 = \$21.60$ , mason's wages.

$\$1.75 \times 7.2 = \$12.60$ , helper's wages.

$$\$115.20$$

$$15.84$$

$$14.40$$

$$21.60$$

$$12.60$$

$$\underline{\$179.64, \text{ Ans.}}$$

86.  $(34 + 27)$  or 61 ft.  $\times 2 = 122$  ft.

$122 \times 9 = 1098$  sq. ft. = 122 sq. yd. ;  $1\frac{1}{2}$  ft. =  $\frac{1}{2}$  yd.

$122$  sq. yd.  $\times \frac{1}{2} = 61$  cu. yd.

$\frac{1}{2} \times \frac{1}{2} \times 3 \times 4 = 3$  cu. yd. in corners.

$61$  cu. yd. +  $3$  cu. yd. =  $64$  cu. yd. in walls.

$1\frac{1}{2} \times 64 = 76\frac{2}{3}$  cu. yd. undressed stone.

$1$  perch, or  $24\frac{2}{3}$  cu. ft.,  $\div 27 = \frac{11}{12}$  cu. yd.

$76\frac{2}{3}$  cu. yd.  $\div \frac{11}{12} = 83\frac{4}{3}$  perches required.

$\$2.50 \times 83\frac{4}{3} = \$209.45\frac{5}{11}$ , cost of stone.

$$\frac{1}{5} \text{ cu. yd.} \times 64 = 12\frac{4}{5} \text{ cu. yd., mortar required.}$$

$$15 \text{ cu. ft.} \div 27 = \frac{5}{9} \text{ cu. yd., mortar for 1 cask of lime.}$$

$$12\frac{4}{5} \text{ cu. yd.} \div \frac{5}{9} = 23\frac{1}{5} \text{ casks of lime.}$$

$$\$1.00 \times 23\frac{1}{5} = \$23.04, \text{ cost of lime.}$$

$$10 \times 23\frac{1}{5} = 230\frac{2}{5} \text{ bu. of sand.}$$

$$\$0.10 \times 230\frac{2}{5} = \$23.04, \text{ cost of sand.}$$

$$1 \text{ day's work} = 3 \text{ cu. yd. (Art. 528.)}$$

$$64 \div 3 = 21\frac{1}{3} \text{ day's work.}$$

$$\$3.00 \times 21\frac{1}{3} = \$64.00, \text{ mason's wages.}$$

$$\$2.00 \times 21\frac{1}{3} = \$42.66\frac{2}{3}, \text{ helper's wages.}$$

$$\$209.45\frac{5}{11}, \text{ cost of stone.}$$

$$23.04, \quad \text{"} \quad \text{lime.}$$

$$23.04, \quad \text{"} \quad \text{sand.}$$

$$64.00, \quad \text{"} \quad \text{mason.}$$

$$42.66\frac{2}{3}, \quad \text{"} \quad \text{helper.}$$

$$\underline{\$362.20\frac{4}{33}}, \text{ Ans.}$$

### Article 538.

87.  $34 \times 25 \times 2 = 1700 \text{ sq. ft.}$

1000 shingles will cover 107 sq. ft. (Art. 533.)

$$1700 \div 107 = 15.887\frac{20}{107} \text{ thousand shingles.}$$

A carpenter will lay 2 M. in 1 day. (Art. 535.)

$$15\frac{20}{107} \div 2 = 7\frac{10}{107} \text{ days' work.}$$

6 lb. nails are allowed for 1 M. shingles.

$$6 \text{ lb.} \times 15.888 = 95.328 \text{ lb. nails,}$$

$$\$2.50 \times 7\frac{10}{107} = \$19.85\frac{10}{107}, \text{ cost of labor,} \quad \left. \vphantom{\$2.50 \times 7\frac{10}{107}} \right\} \text{ Ans.}$$



88.  $30 \text{ ft.} \times 63 \text{ ft.} = 1890 \text{ sq. ft.}$

100 clapboards cover 130 sq. ft. (Art. 534.)

$$1890 \div 130 = 14.53\frac{1}{3} \text{ hundred, Ans.}$$

89.  $64 \times 4 \times 2 = 512 \text{ sq. ft. on both sides.}$

$$512 \text{ sq. ft.} \div 9 = 56\frac{2}{3} \text{ sq. yd.}$$

$$56\frac{2}{3} \div 4 = 14\frac{1}{3} \text{ lb., paint for 1st coat.}$$

$$56\frac{2}{3} \div 4\frac{1}{2} = 12\frac{4}{3} \text{ lb., " 2d "}$$

The first coat requires  $16\frac{1}{3}$  lb. lead to  $7\frac{1}{2}$  lb. oil.

$$16\frac{1}{3} + 7\frac{1}{2} = 24 \text{ lb.}$$

$$\frac{16\frac{1}{3}}{24} \text{ or } \frac{11}{16} \text{ of } 14\frac{1}{3} \text{ lb.} = 9\frac{7}{8} \text{ lb., lead for 1st coat.}$$

$$\frac{7\frac{1}{2}}{24} \text{ or } \frac{5}{16} \text{ of } 14\frac{1}{3} \text{ lb.} = 4\frac{1}{3} \text{ lb., oil " "}$$

The 2d coat requires 20 lb. lead to  $7\frac{1}{2}$  lb. oil.

$$20 + 7\frac{1}{2} = 27\frac{1}{2} \text{ lb.}$$

$$\frac{20}{27\frac{1}{2}} \text{ or } \frac{8}{11} \text{ of } 12\frac{4}{3} = 9\frac{17}{11} \text{ lb., lead for 2d coat.}$$

$$\frac{7\frac{1}{2}}{27\frac{1}{2}} \text{ or } \frac{3}{11} \text{ of } 12\frac{4}{3} = 3\frac{33}{11} \text{ lb., oil " "}$$

$$9\frac{7}{8} + 9\frac{17}{11} = 18\frac{88}{88} \text{ lb., lead required.}$$

$$\$0.09 \times 18\frac{88}{88} = \$1.70\frac{7}{8}, \text{ cost of lead.}$$

$$4\frac{1}{3} + 3\frac{33}{11} = 7\frac{38}{11} \text{ lb., oil required.}$$

1 gallon oil weighs  $7\frac{1}{2}$  lb.

$$7\frac{38}{11} \div 7\frac{1}{2} = 1\frac{232}{485} \text{ gal., oil required.}$$

$$\$0.72 \times 1\frac{232}{485} = \$0.75\frac{272}{485}, \text{ cost of oil.}$$

$$\$1.70\frac{7}{8} + \$0.75\frac{272}{485} = \$2.46\frac{257}{485}, \text{ cost of paint, Ans.}$$

$$56\frac{2}{3} \div 80 = \frac{32}{45} \text{ day's work.}$$

$$\$2.50 \times \frac{32}{45} = \$1.77\frac{7}{9}, \text{ painter's wages, Ans.}$$

90.  $(20 + 18)$  or 38 ft.  $\times 2 = 76$  ft. around the room.  
 $76 \times 10 = 760$  sq. ft. in walls.  
 $18 \times 20 = 360$  sq. ft. in ceiling.  
 $760$  sq. ft. +  $360$  sq. ft. =  $1120$  sq. ft.  
 $1120 - 108 = 1012$  sq. ft. =  $112\frac{2}{3}$  sq. yd.  
 $100$  laths will cover  $5\frac{1}{2}$  sq. yd. (Art. 535.)  
 $112\frac{2}{3} \div 5\frac{1}{2} = 20\frac{2}{3}$  hundred laths, Ans.  
 $20\frac{2}{3}$  hundred =  $2.0\frac{2}{3}$  thousand.  
 $7$  lb. nails are required for 1 M. laths. (Art. 536.)  
 $7$  lb.  $\times 2.0\frac{2}{3} = 14\frac{1}{3}$  lb. nails.  
 $\$0.04\frac{1}{2} \times 14\frac{1}{3} = \$0.644$ , cost of nails, Ans.
91.  $(64 + 40)$  or  $104$  ft.  $\times 2 = 208$  ft.  
 $208 \times 20 = 4160$  sq. ft. in sides.  
 $4160 - 360 = 3800$  sq. ft. =  $3800$  bd. ft.  
 $3800$  bd. ft. =  $3.8$  thousand ft.  
 $\$20 \times 3.8 = \$76$ , cost of boards, Ans.  
A day's work =  $1000$  ft. (Art. 535.)  
 $3.8$  thousand ft. =  $3.8$  days' work.  
 $3.8 \div 2 = 1.9$  days' work for each man.  
 $\$2.25 \times 1.9 = \$4.275$ , each man's wages, Ans.

**Article 543.**

94.  $(3 \times 99) + 5 = 302$ , Ans.
95.  $(\$0.00\frac{1}{3} \times 33) + 12 = \$0.23$ , Ans.
96.  $17 - \left(\frac{8}{9} \times 9\right) = 9$  mi., Ans.
97.  $(\$0.04 \times 15) + 5 = \$0.65$ , Ans.

**Article 544.**

99.  $\frac{(2 + 478)}{2} \times 86 = 20640$ , Ans.

$$100. \frac{(\$7 + \$51)}{2} \times 12 = \$348, \text{ Ans.}$$

**Article 546.**

$$103. 20^4 = 160000; 10 \times 160000 = 1600000, \text{ Ans.}$$

**104.**

$$1.06^8 = 1.191016; \$120 \times 1.191016 = \$142.92192, \text{ Ans.}$$

$$105. \text{ Amount of } \$1 \text{ for 1 y. at } 6\% = \$1.06, \text{ ratio.}$$

$$\$1.06^4 = \$1.26247696.$$

$$\$50 \times 1.26247696 = \$63.123848, \text{ Ans.}$$

**Article 547.**

$$107. 768 \times 2 = 1536; \frac{1536 - 6}{1} = 1530, \text{ Ans.}$$

$$108. \left(\frac{3}{4}\right)^4, \text{ or } \frac{81}{256}, \times 10 = \frac{405}{128}, \text{ last term.}$$

$$\frac{405}{128} \times \frac{3}{4} = \frac{1215}{512}.$$

$$\frac{10 - \frac{1215}{512}}{1 - \frac{3}{4}} = \frac{\frac{3905}{512}}{\frac{1}{4}} = \frac{3905}{128} = 30\frac{44}{128}, \text{ Ans.}$$

$$109. 1.06^8, \text{ or } 1.191016, \times 100 = \$119.1016, \text{ last term.}$$

$$\frac{\$119.1016 \times 1.06 - 100}{0.06} = \$437.4616, \text{ Ans.}$$

$$110. 4^3 = 262144 \times \$0.01 = \$2621.44, \text{ last term.}$$

$$\frac{\$2621.44 \times 4 - \$0.01}{4 - 1} = \$3495.25, \text{ Ans.}$$

**Article 548.**

1.  $.000050 \div .0625 = .0008$ .    Ans. Eight ten-thousandths.

2.  $\frac{4}{5}$  of the goods were destroyed by fire.

$\frac{7}{12}$  of  $\frac{1}{5} = \frac{7}{60}$ , were damaged by water.

$\frac{1}{5} - \frac{7}{60} = \frac{12}{60} - \frac{7}{60} = \frac{5}{60} = \frac{1}{12}$ , were uninjured.

The uninjured goods were sold for \$ 4200.

$\$4200 \times 12 = \$50400$ , cost of the goods.

$\frac{4}{5}$  of \$ 50400 = \$ 40320, value of goods destroyed.

$\frac{7}{60}$  of \$ 50400 = \$ 5880, value of goods damaged.

$\frac{11}{16}$  of \$ 40320 = \$ 27720, the merchant's loss by fire.

$\frac{11}{16}$  of  $\frac{\$5880}{2} = \$2021.25$ ,    "    "    "    water.

$\$27720 + \$2021.25 = \$29741.25$ , Ans.

3.  $2^m \times 1.3^m \times 1.5^m = 3.9^{cm}$ ;  $3.9^{cm} = 3.9^{kl}$ .

$1^{kl} = 10^{ml}$ ;  $10^{ml} \times 3.9 = 39^{ml}$ , Ans.

4.  $100\% - 8\% = 92\%$ ; \$ 230 = 92%.

$\frac{\$230}{92} \times 100 = \$250$ , cost of the lot.

$\$300 - \$250 = \$50$ , gain.

$\frac{50}{250} = \frac{1}{5}$ ;  $\frac{1}{5}$  of 100% = 20%, Ans.

**Article 549.**

$$\begin{array}{l}
 2\frac{4}{5} \div \frac{4}{10} \times 2 = \frac{21}{8} \times \frac{1}{8} \times 2 = \frac{21}{32} = \frac{21}{79} \times \frac{5}{40} = \\
 2 - \frac{1}{4} \div 5 = 2 - \frac{1}{8} \times \frac{1}{5} = 2 - \frac{1}{40} = \frac{79}{40} = \frac{79}{40} \times \frac{5}{40} = \frac{105}{316}, \text{ Ans.}
 \end{array}$$

$$2. \quad \frac{7}{5} + \frac{1}{3} + \frac{5}{8} = \frac{168}{120} + \frac{40}{120} + \frac{75}{120} = \frac{283}{120} = 2\frac{43}{120}, \text{ Ans.}$$

$$\frac{7}{5} \times \frac{1}{3} \times \frac{5}{8} = \frac{7}{24}, \text{ Ans.}$$

$$3. \quad 3'845'672'000 (1566.7+, \text{ Ans.}$$

1	
300	2845
150	
25	
475	2375
67500	470672
2700	
36	
70236	421416
7300800	49256000
28080	
36	
7328916	43973496
735706800	5282504000
328860	
49	
736035709	5152249963
130254037	

- 4.
- $3'53'44''00'.50'00'00'00$
- (1880.0001+, Ans.

$$\begin{array}{r}
 1 \\
 28 \overline{) 253} \\
 \underline{224} \\
 368 \overline{) 2944} \\
 \underline{2944} \\
 37600001 \overline{) 00.50000000} \\
 \underline{37600001} \\
 12399999
 \end{array}$$

5. 1 sq. meter = 1.196 sq. yd. = 10.764 sq. ft. Since 1 sq. ft. sustains 100 lb., 10.764 sq. ft. will sustain  $10.764 \times 100 = 1076.4$  lb.; hence, 1 sq. meter sustains 1076.4 lb. 1 kilogram = 2.2046 lb.  $1076.4 \div 2.2046 = 488.25+$  kilograms, Ans.

- 6.
- $6\frac{1}{3}\%$
- of \$25000 = \$1583
- $\frac{1}{3}$
- , cost of the horse.

$$\$1583\frac{1}{3} - \$1000 = \$583\frac{1}{3}, \text{ loss.}$$

$$\frac{583\frac{1}{3}}{1583\frac{1}{3}} = \frac{\overset{7}{\cancel{1750}}}{\underset{19}{\cancel{3}}} \times \frac{\underset{19}{\cancel{3}}}{\underset{19}{\cancel{4750}}} = \frac{7}{19}; \frac{7}{19} \text{ of } 100\% = 36\frac{4}{19}\%, \text{ Ans.}$$

**Article 550.**

- 1.
- $45007021 - 30026003 = 14981018$
- .

$$100000000 - 14981018 = 85018982.$$

Eighty-five million eighteen thousand nine hundred eighty-two, Ans.

- 2.
- $\frac{2}{3} + \frac{4}{15} = \frac{10}{15} + \frac{4}{15} = \frac{14}{15}$

$$\frac{14}{15} - \frac{1}{10} = \frac{28}{30} - \frac{3}{30} = \frac{25}{30} = \frac{5}{6}$$

$$\frac{1}{8} + \frac{1}{9} + \frac{1}{10} = \frac{45}{360} + \frac{40}{360} + \frac{36}{360} = \frac{121}{360}$$

$$\frac{\overset{11}{\cancel{121}}}{\underset{120}{\cancel{360}}} \text{ of } \frac{\overset{11}{\cancel{121}}}{\underset{120}{\cancel{360}}} = \frac{11}{120}; \frac{5}{6} \div \frac{11}{120} = \frac{100}{11} = 9\frac{1}{11}, \text{ Ans.}$$

3.  $375 \div .75 = 500$ ;  $.75 \div 375 = .002$ .

$500 + .002 = 500.002$ , Ans.

$500 - .002 = 499.998$ , Ans.

4. 2 T. 3 cwt. 48 lb. = 4348 lb.; 18 cwt. 75 lb. = 1875 lb.

$4348 \text{ lb.} - 1875 \text{ lb.} = 2473 \text{ lb., net weight.}$

$2473 \text{ lb.} \div 215 = 11\frac{1}{2}\frac{2}{3} \text{ lb., weight of each package.}$

1 kilogram = 2.2046 lb.

$11\frac{1}{2}\frac{2}{3} \text{ lb.} \div 2.2046 = 5.217 \text{ kilograms.}$

$5.217 \text{ kilograms} = 5 \text{ kilograms, } 217 \text{ grams, Ans.}$

5. Interest is money paid for the use of money.

*Rule.* — Multiply the principal by the rate, and the product by the time in years. The product of the principal by the rate = 1 year's interest, which being multiplied by the number of years gives the required interest.

6.  $1'84.'20'00'00$  ( 13.572+, Ans.

	1
23	84
	69
265	1520
	1325
2707	19500
	18949
27142	55100
	54284

### Article 55L

1.  $315 = 3 \times 3 \times 5 \times 7$ .

$504 = 2 \times 2 \times 2 \times 3 \times 3 \times 7$ .

$441 = 3 \times 3 \times 7 \times 7$ .

$3 \times 3 \times 7 = 63$ , greatest common divisor.

$$\frac{\frac{3}{4} - \frac{1}{5} \times \frac{10}{6}}{3\frac{1}{2} - 2\frac{1}{4}} = \frac{\frac{3}{4} - \frac{1}{3}}{\frac{20}{6} - \frac{17}{6}} = \frac{\frac{5}{12}}{\frac{1}{2}} = \frac{5}{6}; \quad \frac{2}{3} \times \frac{5}{\frac{5}{3}} = \frac{5}{9} = 0.555\frac{5}{9}, \text{ Ans.}$$

3. 57 gal.  $3\frac{1}{2}$  pt. = 57.4375 gal.

1 hektoliter = 26.42 gallons.

$$57.4375 \div 26.42 = 2.17 + \text{hektoliters, Ans.}$$

4. (18 ft. + 12 ft.), or 30 ft.,  $\times 2 = 60$  ft.

$$60 \text{ ft.} \times 10 \text{ ft.} = 600 \text{ sq. ft.} = 66\frac{2}{3} \text{ sq. yd.}$$

$$66\frac{2}{3} \text{ sq. yd.} \div 1\frac{1}{3} = \frac{200}{3} \times \frac{8}{9} = \frac{1600}{27} = 59\frac{7}{27} \text{ yd., Ans.}$$

5.  $100\% - 8\% = 92\%$ ;  $\$230 = 92\%$ .

$$\frac{\$230}{92} \times 100 = \$250, \text{ cost of the sugar.}$$

$$\$300 = \$250 - \$50, \text{ gain.}$$

$$\frac{50}{250} = \frac{1}{5}; \quad \frac{1}{5} \text{ of } 100\% = 20\%, \text{ Ans.}$$

### Article 552

$$1. \quad \frac{4\frac{1}{2}}{8\frac{1}{10}} = \frac{34}{7} \times \frac{10}{89} = \frac{340}{623}; \quad \frac{3}{7\frac{1}{2}} = \frac{3}{1} \times \frac{8}{\frac{57}{19}} = \frac{8}{19}$$

$$\frac{340}{623} \text{ of } \frac{8}{19}, \text{ or } \frac{2720}{11837}, \div \frac{6}{11} = \frac{14960}{35511} = .4212$$

$$\sqrt{0.4212} = 0.644, \text{ Ans.}$$



$$2. .37 : 8.9 = 4.3 : x \quad \frac{8.9 \times 4.3}{.37} = 103.432432$$

$$\sqrt[3]{103.432432} = 4.69+, \text{ Ans.}$$

$$3. 8 \text{ in.} \div 12 = .6666\frac{2}{3} \text{ ft.}; 2.6666\frac{2}{3} \text{ ft.} \div 16\frac{1}{2} = .161\frac{1}{8}\frac{1}{2} \text{ rd.}$$

$$16.161\frac{1}{8}\frac{1}{2} \text{ rd.} \div 320 = 0.050\frac{4}{8}\frac{1}{2} \text{ mile, Ans.}$$

$$4. .1335 \text{ are} = 13.35^{\text{am}}; \sqrt{13.35^{\text{am}}} = 3.65+^{\text{m}}.$$

$$3.65+^{\text{m}} = 36.5^{\text{dm}}+, \text{ Ans.}$$

### Article 553.

$$1. 4\frac{1}{2} + 2\frac{1}{3} \div \frac{2}{3} = \frac{9}{2} + \frac{7}{3} \times \frac{3}{2} = \frac{9}{2} + \frac{7}{2} = \frac{16}{2} = 2, \text{ Ans.}$$

$$\frac{6\frac{1}{2} - 1\frac{1}{3} \times \frac{3}{2}}{\frac{3}{2}} = \frac{13}{2} - \frac{5}{3} \times \frac{3}{2} = \frac{13}{2} - \frac{5}{2} = \frac{8}{2}$$

$$2. 6 = 2 \times 3; 8 = 2 \times 2 \times 2; 20 = 2 \times 2 \times 5.$$

$$36 = 2 \times 2 \times 3 \times 3.$$

$$2^3 \times 3^2 \times 5 = 360, \text{ least common multiple.}$$

$$2 = \text{greatest common divisor.}$$

$$3. 25 \text{ ft.} = 300 \text{ in.}; 1 \text{ meter} = 39.37 \text{ in.}$$

$$300 \text{ in.} \div 39.37 = 7.62 \text{ meters, Ans.}$$

$$4. \quad 3'53'06''/41 \text{ (1879, Ans.}$$

$$\begin{array}{r} 1 \\ 28 \overline{) 253} \\ \underline{224} \\ 367 \\ \overline{) 2906} \\ \underline{2569} \\ 3749 \\ \overline{) 33741} \\ \underline{33741} \end{array}$$

5. \$1 in gold was worth  $\$1.12\frac{1}{2}$ , currency.

$$\$1 \div 1.12\frac{1}{2} = \$0.88\frac{2}{3}, \text{ Ans.}$$

6. 100% = sum to be invested; 5% = commission.

$$\$1200 = 105\%; \quad \frac{\$1200}{105} \times 100 = \$1142\frac{2}{3}, \text{ Ans.}$$

### Article 554

1. (1.) A composite number is a number having other factors than itself and one.

(2.) A factor of a number is one of the integers which produce the number when multiplied together.

(3.) An abstract number is one in which no particular kind of unit is named.

(4.) The cube root of a number is one of the three equal factors which produce it.

(5.) Equation of payments is the process of finding when several debts, due at different times, may be paid at one time without loss to either debtor or creditor.

2. 50 lb. 8 oz. = 608 oz.

$$\$20.59\frac{1}{4} \times 608 = \$12520.24, \text{ Ans.}$$

3. 1 mile =  $5280 \times 12$  in. = 63360 in.

$$63360 \div 39.37 = 1609.347 \text{ meters.}$$

$$1609.347 \text{ meters} = 1.6093\frac{1}{2} \text{ kilometers, Ans.}$$

$$4. \quad \frac{2}{3} \text{ of } 7\frac{3}{4} = \frac{2}{3} \text{ of } \frac{31}{\frac{4}{2}} = \frac{31}{6}; \quad \frac{4}{5} \text{ of } 12\frac{1}{2} = \frac{4}{5} \text{ of } \frac{25}{\frac{2}{3}} = \frac{31}{3}$$

$$\frac{\frac{31}{6}}{\frac{31}{3}} = \frac{31}{6} \times \frac{3}{31} = \frac{1}{2}, \text{ Ans.}$$

$$\frac{2}{3} \text{ of } 7\frac{3}{4} = .6\frac{2}{3} \times 7.75 = 5.166\frac{2}{3}.$$

$$\frac{4}{5} \text{ of } 12\frac{1}{2} = .8 \times 12.91\frac{2}{3} = 10.333\frac{1}{3}. \quad \frac{5.166\frac{2}{3}}{10.333\frac{1}{3}} = .5.$$

5. He disposed of  $\frac{1}{2} + \frac{1}{3} + \frac{1}{4}$ , or  $\frac{13}{12}$ , of his income, which was manifestly impossible. His obvious intention was to dispose of it in the proportion of  $\frac{1}{2}$ ,  $\frac{1}{3}$ , and  $\frac{1}{4}$ , or  $\frac{6}{12}$ ,  $\frac{4}{12}$ ,  $\frac{3}{12}$ .

6 of the 13 twelfths, or  $\frac{6}{13}$ , of \$780, or \$360, was spent.

4 of the 13 twelfths, or  $\frac{4}{13}$ , of \$780, or \$240, was saved.

3 of the 13 twelfths, or  $\frac{3}{13}$ , of \$780, or \$180, was devoted to business.

6. \$125  $\times$  .07 $\frac{1}{2}$  = \$9.375, interest for 1 year.

$$\$15 \div 9.375 = 1\frac{2}{3} \text{ years, Ans.}$$

7. The annual income of a share of 6% stock = \$6.

If the cost is \$75, the income is  $\frac{6}{75}$  of 100% = 8%, Ans.

8.  $.726/572/699$  (.899, Ans.

512	
19200	214572
2160	
81	
<u>21441</u>	192969
2376300	21603699
24030	
81	
<u>2400411</u>	21603699

**Article 555.**

1.  $\frac{\frac{1}{8}}{\frac{2}{8}} \times \frac{\frac{4}{8}}{\frac{3}{8}} \times \frac{\frac{5}{9}}{\frac{3}{9}} = \frac{1}{6}$

$$\frac{1}{6} + \frac{7}{15} + \frac{3}{4} + \frac{9}{10} = \frac{10}{60} + \frac{28}{60} + \frac{45}{60} + \frac{54}{60} = \frac{137}{60} = 2\frac{17}{60}, \text{ Ans.}$$

2.  $\frac{4}{64} = \frac{\frac{2}{4}}{1} \times \frac{7}{\frac{46}{23}} = \frac{14}{23}; \quad \frac{14}{23} - \frac{1}{7} = \frac{98}{161} - \frac{23}{161} = \frac{75}{161}$

$$\frac{75}{161} \div \frac{8}{11} = \frac{75}{161} \times \frac{11}{8} = \frac{825}{1288}, \text{ Ans.}$$

3.  $\frac{1}{\sqrt{3}} = \frac{1}{1.732} = 0.577+, \text{ Ans.}$

4.  $3.81 : 0.056 = 1.67 : x$

$$\frac{0.056 \times 1.67}{3.81} = 0.024381, \text{ Ans.}$$

5. 3 R. 13 sq. rd. 8 sq. ft. =  $36217\frac{1}{4}$  sq. ft.

1 acre = 43560 sq. ft.

$$36217.25 \div 43560 = 0.8314\frac{733}{1178} \text{ acre, Ans.}$$

6. (a)  $4^m \times 0.4^m = 1.6^{mq}$ .

$$1.6^{mq} \times 100 = 160^{mq}, \text{ Ans.}$$

(b)  $90^{cl} = .009^{mi}$ ;  $2700^{mi} \div .009^{mi} = 300000, \text{ Ans.}$

### Article 556.

$$1. \frac{1 + \frac{8}{3} + \left(\frac{4}{3}\right)^2}{\left(\frac{4}{3}\right)^2 - 1} = \frac{\frac{9}{9} + \frac{24}{9} + \frac{16}{9}}{\frac{16}{9} - \frac{9}{9}} = \frac{\frac{49}{9}}{\frac{7}{9}}$$

$$\frac{\frac{49}{9}}{\frac{7}{9}} = \frac{49}{9} \times \frac{9}{7} = 7, \text{ Ans.}$$

2. 1 kilometer 8 meters =  $1008^m$ .

$4\frac{1}{2}$  hektometers =  $448^m$ .

$1008^m \times 448^m = 451584^{mq}$ .

$$\sqrt{451584} = 672^m = 67.2^{Dm}, \text{ Ans.}$$

3.

$$10 = 2 \times 5$$

$$12 = 2 \times 2 \times 3$$

$$14 = 2 \times 7$$

$$16 = 2 \times 2 \times 2 \times 2$$

$$18 = 2 \times 3 \times 3$$

$$20 = 2 \times 2 \times 5$$

$2^4 \times 3^2 \times 5 \times 7 = 5040, \text{ least common multiple, Ans.}$

$$4. \$2500 \times .01 \times \frac{1}{5} = \$5, \text{ int. at } 1\%.$$

$$\$45 \div \$5 = 9, \text{ or } 9\%, \text{ Ans.}$$

$$5. \left. \begin{array}{l} 30 : 25 \\ 10 : 8 \\ 3 : 5 \\ \frac{8}{8} : \frac{8}{8} \end{array} \right\} = 24 : x \quad \frac{\overset{5}{25} \times \overset{2}{8} \times \overset{4}{24} \times 5}{\underset{6}{30} \times \underset{2}{10} \times 3} = \frac{80}{3} = 26\frac{2}{3} \text{ d., Ans.}$$

**Article 557.**

$$\begin{array}{r}
 1 \quad 20570. \\
 \quad 6206. \\
 \quad \quad 98.007 \\
 \quad 63000. \\
 \quad \quad 426.000626 \\
 \quad 4287. \\
 \quad \quad 63.961 \\
 102030. \\
 \quad 405.0607 \\
 \quad 8090. \\
 \quad 543.21 \\
 \hline
 1028848.414995 \\
 1234567.654321, \text{ Ans.}
 \end{array}$$

$$2. 1595864.$$

$$3. \overline{\text{LXXXIV}}\text{DCCXCVL}$$

4. Twenty million five hundred sixty-seven thousand one hundred eighty-nine, and four million three hundred twenty-one thousand ninety-eight billionths.

$$33037787331, \text{ Ans.}$$

$$5. \quad 96813 \overline{) 31984875832}$$

$$\begin{array}{r} 290439 \\ \hline 294097 \\ \hline 290439 \\ \hline 365858 \\ 290439 \\ \hline 754193 \\ 677691 \\ \hline 765022 \\ 677691 \\ \hline 87331 \end{array}$$

$$6. \quad (28 - 7) \times 6 = 21 \times 6 = 126.$$

$$(92 + 7) \div 9 = 99 \div 9 = 11.$$

$$(86 + 10) \div 12 = 96 \div 12 = 8.$$

$$126 + 11 - 8 = 129, \text{ Ans.}$$

$$7. \quad \frac{15 \times \overset{A}{80} \times 27 \times \overset{2}{\underset{2}{28}}}{\underset{2}{7} \times \underset{2}{20} \times \underset{2}{8}} = 810, \text{ Ans.}$$

$$8. \quad \frac{2}{21}, \frac{12}{87}, \frac{26}{169}, \frac{1}{4} = \frac{39208}{411684}, \frac{56784}{411684}, \frac{63336}{411684}, \frac{102921}{411684}.$$

$$9. \quad \frac{39208}{411684} + \frac{56784}{411684} + \frac{63336}{411684} + \frac{102921}{411684} = \frac{262249}{411684} = .637\frac{121}{177}, \text{ Ans.}$$

$$10. \quad 7955 = 5 \times 37 \times 43; 8769 = 3 \times 37 \times 79.$$

$$6401 = 37 \times 173; 37 = \text{greatest common divisor, Ans.}$$

11.  $52 \text{ rd. } 14 \text{ ft. } 8 \text{ in.} = 872\frac{2}{3} \text{ ft.}$

$$\$0.75 \times 872\frac{2}{3} = \$654.50, \text{ Ans.}$$

12. The sun is at meridian in the more easterly of two places first, as his apparent daily journey is from the east towards the west.

Timepieces carried from the west to the east will be too slow by 1 hour for each  $15^\circ$  of travel. (Art. 486.) A traveler whose watch is 2 h. 22 min. slow has, therefore, traveled *eastward*  $2\frac{2}{3} \times 15^\circ$ , or  $35^\circ 30'$ , Ans.

13.  $50 \text{ bushels} = \frac{50}{30000}$  of 30000 bushels.

$$\frac{50}{30000} = \frac{1}{600}; \quad \frac{1}{600} \text{ of } 100\% = \frac{1}{6}\%$$

.001 $\frac{2}{3}$ , or one sixth of one per cent, Ans.

14. The number = 100% of itself;  $100\% - 36\% = 64\%$ .  
 $336 = 64\%$  of the number.

$$\frac{\overset{21}{\cancel{336}}}{\underset{16}{64}} \times \frac{25}{100} = 525, \text{ Ans.}$$

15.  $70 \text{ rd.} \times 20 \text{ rd.} = 1400 \text{ sq. rd.}$

$$1400 \text{ sq. rd.} \div 160 \text{ sq. rd.} = 8\frac{1}{2} \text{ acres.}$$

$$\$47.25 \times 8\frac{1}{2} = \$413.43\frac{3}{4}, \text{ Ans.}$$



16. The first will fill  $\frac{1}{12}$  of it in 1 hour.

The second will fill  $\frac{1}{16}$  of it in 1 hour.

The third will fill  $\frac{1}{18}$  of it in 1 hour.

Together they will fill  $\frac{1}{12} + \frac{1}{16} + \frac{1}{18}$ , or  $\frac{29}{144}$ , in 1 hour.

To fill  $\frac{144}{144}$ , or the cistern, it will take as many hours as

$$\frac{144}{144} \div \frac{29}{144} = 4\frac{29}{29} \text{ h., Ans.}$$

$$12 \text{ h.} : 1 \text{ h.} = 1 \text{ cistern} : \frac{1}{12} \text{ cistern.}$$

$$16 \text{ " } : 1 \text{ " } = 1 \text{ " } : \frac{1}{16} \text{ "}$$

$$18 \text{ " } : 1 \text{ " } = 1 \text{ " } : \frac{1}{18} \text{ "}$$

$$\frac{29}{144} \text{ cistern} : \frac{144}{144} \text{ cistern} = 1 \text{ h.} : 4\frac{29}{29} \text{ h.}$$

17.  $\$328 \times .07 \times 2\frac{7}{8} = \$59.31$ , simple interest.

Principal for 1st year . . . . .	\$ 328.00
Interest " " . . . . .	19.68
Principal for 2d year. . . . .	\$ 347.68
Interest " " . . . . .	20.86
Principal for 7 mo. . . . .	\$ 368.54
Interest " " . . . . .	12.90
Compound amount for 2 y. 7 mo. . . . .	\$ 381.44
Given principal . . . . .	328.00
Compound interest for 2 y. 7 mo. . . . .	\$ 53.44

$$\$59.31 - \$53.44 = \$5.87, \text{ Ans.}$$

## 18.

Principal . . . . .	\$ 580.00
Int. from Jan. 1, 1879, to July 1, 1879, 6 mo. . . .	14.50
Amount . . . . .	<u>\$ 594.50</u>
1st payment . . . . .	85.00
New principal . . . . .	<u>\$ 509.50</u>
Int. from July 1, 1879, to Jan. 1, 1880, 6 mo. . . .	12.74
Amount . . . . .	<u>\$ 522.24</u>
2d payment . . . . .	85.00
New principal . . . . .	<u>\$ 437.24</u>
Int. from Jan. 1, 1880, to July 1, 1880, 6 mo. . . .	10.93
Amount . . . . .	<u>\$ 448.17</u>
3d payment . . . . .	85.00
New principal . . . . .	<u>\$ 363.17</u>
Int. from July 1, 1880, to Jan. 1, 1881, 6 mo. . . .	9.08
Amount . . . . .	<u>\$ 372.25</u>
4th payment . . . . .	85.00
New principal . . . . .	<u>\$ 287.25</u>
Int. from Jan. 1, 1881, to March 4, 1881, 2 mo. 3 d.	2.51
Amount due March 4, 1881 . . . . .	<u>\$ 289.76</u>

$$19. \$1 \times .05 \times \frac{25}{36} = \$0.034\frac{1}{3}.$$

$$\$1 + \$0.034\frac{1}{3} = \$1.034\frac{1}{3}.$$

$$\$3725.87 \div \$1.034\frac{1}{3} = \$3600.84, \text{ present worth.}$$

$$\$3725.87 - \$3600.84 = \$125.03, \text{ discount, Ans.}$$

$$20. \$115 - \$110 = \$5, \text{ or } 5\%, \text{ loss.}$$

$$\$300 = 5\% \text{ of the value of the bonds.}$$

$$\frac{\$300}{5} \times \frac{20}{100} = \$6000, \text{ value of bonds.}$$

$$\$6000 \div \$1000 = 6, \text{ number of bonds, Ans.}$$

21. A's \$4000 for 8 mo. = \$32000 for 1 mo.

B's \$6000 " 7 " = \$42000 "

C's \$3500 " 12 " = \$42000 "

The entire stock = \$116000 for 1 mo.

$$\frac{32000}{116000} = \frac{8}{29}; \quad \frac{8}{29} \text{ of } \$2320 = \$640, \text{ A's share.}$$

$$\frac{42000}{116000} = \frac{21}{58}; \quad \frac{21}{58} \text{ of } \$2320 = \$840, \text{ B's "}$$

$$\frac{42000}{116000} = \frac{21}{58}; \quad \frac{21}{58} \text{ of } \$2320 = \$840, \text{ C's "}$$

22. 1 horse eats  $\frac{1}{5}$  of 6 =  $\frac{6}{5}$  as much as 1 ox.

$$8 \text{ horses eat } 8 \times \frac{6}{5} = 9\frac{4}{5}; \quad 9\frac{4}{5} + 12 = 21\frac{4}{5} \text{ oxen.}$$

$$7 \text{ " " } 7 \times \frac{6}{5} = 8\frac{4}{5}; \quad 8\frac{4}{5} + 15 = 23\frac{4}{5} \text{ "}$$

$$\left. \begin{array}{l} 21\frac{4}{5} : 23\frac{4}{5} \\ 40 : 65 \end{array} \right\} = 12 : x \quad \frac{\overset{13}{5} \times \overset{13}{65} \times \overset{13}{117} \times \overset{13}{12}}{\underset{9}{108} \times \underset{8}{40} \times \underset{5}{5}} = \frac{169}{8} = 21\frac{1}{8} \text{ T., Ans.}$$

23. 0.'000'238'328 ( 0.062, Ans.

	216
10800	22328
360	
4	
11164	22328

24. 15 mi.  $\times$  6 = 90 mi. ; 18 mi.  $\times$  6 = 108 mi.

$$90^2 + 108^2 = 8100 + 11664 = 19764.$$

$$\sqrt{19764} = 140.5 \text{ mi., Ans.}$$

25. 1 bbl. =  $31\frac{1}{2}$  gal. ;  $300 \times 31\frac{1}{2}$  gal. = 9450 gal.  
 1 gal. = 231 cu. in. ;  $9450 \times 231 = 2182950$  cu. in.  
 $\sqrt[3]{2182950} = 129.7$  in., length of 1 edge.  
 $129.7$  in. =  $3.6$  yd. ;  $3.6^2 = 12.96$  sq. yd. in 1 side.  
 $12.96$  sq. yd.  $\times 4 = 51.84$  sq. yd. in 4 sides.  
 $3.6^2$  yd. =  $12.96$  sq. yd. in bottom.  
 $51.84$  sq. yd. +  $12.96$  sq. yd. =  $64.8$  sq. yd.  
 $\$0.30 \times 64.8 = \$19.44$ , Ans.

26.  $5$  ft.  $\times 3.1416 = 15.708$  ft. = circumference.

$$\frac{15.708}{2} \times \frac{5}{2} = 19.635 \text{ sq. ft., area, Ans.}$$

27.  $5$  ft. square =  $5 \times 5$  sq. ft. =  $25$  sq. ft.

$$25 \text{ sq. ft.} - 5 \text{ sq. ft.} = 20 \text{ sq. ft., Ans.}$$



